INSTRUCTOR
WRITTEN TEST BOOK

U.S. Department of Transportation
Federal Aviation Administration

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Aviation Standards National Field Office

Flight Instructor Additional Rating—Rotorcraft/Helicopter
Flight Instructor Additional Rating—Rotorcraft/Gyroplane
Basic Ground Instructor
Advanced Ground Instructor

Applicants may use this written test book as a study guide. It is issued as FAA-T-8080-18, Flight and Ground Instructor Written Test Book, and is available to the public from:

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U.S. Government Printing Office
Washington, DC 20402-9325

or from U.S. Government Printing Office bookstores located in major cities throughout the United States.

The questions included in this publication are predicated on regulations, references, principles, and practices that were valid at the time of publication. The question selection sheets prepared for use with this written test book are security items and are revised at frequent intervals.

The FAA does NOT publish, supply, or make available, the correct answers to questions included in this written test book. Students should determine the correct answers through research and study of appropriate subject material, by working with instructors, or by attending appropriate ground schools. The FAA is NOT responsible for either the content of commercial reprints of this written test book, or the accuracy of any answers they may supply.

Comments regarding this publication should be directed to:

Federal Aviation Administration
Operations Standards Development Section, AVN-131
P.O. Box 25082
Oklahoma City, OK 73125-0082

APPENDIX 2

2. Question selection sheet which identifies the questions to be answered.

3. Plastic overlay sheet which can be placed over performance charts for plotting purposes.

TEST INSTRUCTIONS

1. Read the instructions on page 1 of AC Form 8080-3, and complete page 4 of the form. Incomplete or erroneous personal information entered on this form delays the scoring process.

2. The questions in this written test book are numbered consecutively beginning with 3001. Refer to the question selection sheet to determine which questions to answer.

3. For each question number on the answer sheet, find the appropriate question in the written test book.

4. Mark your answer in the space provided for each question number on the answer sheet. Spaces 1, 2, or 3 left unmarked will be counted by the computer scanner as a miss.

5. The test questions are of the multiple-choice type. Until revised, answer sheets contain selections listed as 1, 2, 3, and 4 and should be interpreted as A, B, and C respectively. Selection 4 should never be used.

6. The supplementary material required to answer the questions will be found in appendix 2.

7. Read each question carefully and avoid hasty assumptions. Do not answer until you understand the question. Do not spend too much time on any one question. Answer all of the questions that you readily know and then reconsider those you find difficult. Be careful to make necessary conversions when working with temperatures, speeds, and distances.

8. If a regulation or operations procedure is changed after this written test book is printed, you will receive credit for the affected question.

DO NOT USE THIS BOOK UNLESS IT CORRESPONDS WITH THE BOOK NUMBER ON THE TEST.

THE MINIMUM PASSING GRADE IS 70.

(2) Give to another, or receive from another, any part or copy of that test;

(3) Give help on that test to, or receive help on that test from, any person during the period that test is being given;

(4) Take any part of that test in behalf of another person;

(5) Use any material or aid during the period that test is being given; or

ground instructor certificate or rating, or to take any test therefor, under this chapter for a period of 1 year after the date of that act. In addition, the commission of that act is a basis for suspending or revoking any airman or ground instructor certificate or rating held by that person.

The written test book is scheduled for revision each 24 months. Associated question selection sheets will be revised periodically, as required.

Testing and Scoring

The written test may be taken at FAA testing centers, FAA written test examiner's facilities, or other designated places.

The applicant is issued a "clean copy" of this written test book, an appropriate question selection sheet indicating the specific questions to be answered, and AC Form 8080-3, Airman Written Test Application, which includes the answer sheet. The written test book contains all supplementary material required to answer the questions. Supplementary material is located in appendix 2.

Instructions for completing the test are contained on page vii of this written test book.

Upon completion of the test, the applicant must surrender the issued written test book, question selection sheet, answer sheet, and any papers used for computations or notations to the monitor before leaving the test room.

The answer sheet is sent to the Mike Monroney Aeronautical Center in Oklahoma City, Oklahoma, where it is scored by computer. The applicant is then issued AC Form 8080-2, Airman Written Test Report. This form will list the test score and subject matter knowledge codes referencing the subjects in which the applicant is deficient. Retain AC Form 8080-2 to be presented for the practical test, or for retesting in the event of written test failure.

The written test subject matter knowledge codes are then matched to the corresponding subject matter knowledge areas published in appendix 1 of this written test book. The applicant should be aware that a subject matter code on AC Form 8080-2 appears only once even though more than one question may have been missed in that subject area. Therefore, the number of subject matter codes on AC Form 8080-2 may not represent the number of questions missed on the test.

When taking the test, the applicant should keep the following points in mind:

1. Answer each question in accordance with the latest regulations and procedures.

2. Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.

3. After formulating an answer, determine which of the alternatives most nearly corresponds with that answer. The answer chosen should completely resolve the problem.

4. From the answers given, it may appear that there is more than one possible answer; however, there is only one answer that is correct and complete. The other answers are either incomplete or are derived from popular misconceptions.

5. If a certain question is difficult for you, it is best to proceed to other questions. After you answer the less difficult questions, return to those which gave you difficulty. Be sure to indicate on your question selection sheet the questions to which you wish to return.

6. When solving a calculator problem, select the answer nearest your solution. The problem has been checked with various types of calculators; therefore, if you have solved it correctly, your answer will be closer to the correct answer than to any of the other choices.

apply for retesting before the 30 days have expired upon presenting a written statement from an authorized instructor certifying that he has given flight or ground instruction as appropriate to the applicant and finds him competent to pass the test.

A— habitual.
B— experiential.
C— problem solving.

3003. While learning the material being taught, students may be learning other things as well. This additional learning is called

A— residual.
B— conceptual.
C— incidental.

3004. Individuals learn best when they are willing to learn. This is a feature of the law of

A— primacy.
B— readiness.
C— willingness.

3005. The law of exercise is the basis of

A— practice and drill.
B— correlation and performance.
C— understanding and application.

3006. Teaching the student to perform a task right the first time is an example of the law of

A— effect.
B— primacy.
C— intensity.

3007. The law that is based on the emotional reaction of the learner is the law of

A— effect.
B— primacy.
C— intensity.

school lesson or a postflight critique?

A— Law of effect.
B— Law of recency.
C— Law of exercise.

3010. Which law of learning states that learning is weakened when associated with an unpleasant feeling?

A— Law of effect.
B— Law of primacy.
C— Law of intensity.

3011. Things most often repeated are best remembered because of which law of learning?

A— Law of effect.
B— Law of recency.
C— Law of exercise.

3012. When meaning is given to the input from the five senses, this is called

A— sensation.
B— perception.
C— understanding.

3013. Which factor adversely affects students' perceptions by narrowing their perceptual field?

A— Basic need.
B— Physical organism.
C— Element of threat.

3014. Perceptions result when a person

A— groups together bits of information.
B— gives meaning to sensations being experienced.
C— responds to visual cues first, then aural cues, and relates these cues to ones previously learned.

A— Motivations must be tangible to be effective.
B— Motivations may be very subtle and difficult to identify.
C— Negative motivations often are as effective as positive motivations.

3017. Motivations that cause a student to react with fear and anxiety are

A— inverse.
B— tangible.
C— negative.

3018. For a motivation to be effective, students must believe their efforts will be rewarded in a definite manner. This type of motivation is

A— subtle.
B— negative.
C— tangible.

3019. Which is generally the more effective way for the instructor to properly motivate students?

A— Maintain pleasant personal relationships with students.
B— Provide positive motivations by the promise or achievement of rewards.
C— Reinforce their self-confidence by requiring no tasks beyond their ability to perform.

3020. Motivations in the form of reproof and threats should be avoided with all but the student who is

A— discouraged.
B— disinterested.
C— overconfident.

B— pointing out the attractive features of the activity to be learned.
C— keeping the rate of learning consistent so that it is predictable.

3023. In the learning process, fear or the element of threat will

A— inspire the student to improve.
B— narrow the student's perceptual field.
C— decrease the rate of associative reactions.

3024. Evoking student insights is one of the instructor's major responsibilities. This involves the

A— analysis of a student by the instructor.
B— grouping of perceptions into meaningful wholes.
C— student's grasp of principles as they are taught.

3025. Insights, as applied to learning, involve a person's

A— self-concept of self-image.
B— grouping of associated perceptions into meaningful wholes.
C— ability to recognize the reason for learning a procedure.

3026. Instruction, as opposed to the trial and error method of learning, is desirable because competent instruction speeds the learning process by

A— motivating the student to a better performance.
B— emphasizing only the important points of training.
C— teaching the relationship of perceptions as they occur.

3029. In levels of learning, what are the steps of progression?

A— Rote, understanding, correlation, application.
B— Rote, understanding, application, correlation.
C— Rote, application, understanding, correlation.

3030. The level of learning at which a person can copy a sequence of movements is

A— rote.
B— basic.
C— initiative.

3031. The level of learning at which the student becomes able to associate an element which has been learned with other blocks of learning is

A— application.
B— association.
C— correlation.

3032. A basic motivation for all human endeavor is the desire

A— of achievement.
B— for personal gain.
C— for personal comfort.

3033. The best way to prepare a student to perform a task is to

A— provide a clear, step-by-step example.
B— give the student an outline of the task.
C— lead the student very slowly through the task.

3034. The performance of rectangular patterns helps a student fly traffic patterns. What type of transfer of learning is this?

A— Lateral.
B— Positive.
C— Concomitant.

B— student's intellectual level.
C— length of the practice session.

3037. Which transfer of learning occurs when the performance of a maneuver interferes with the learning of another maneuver?

A— Adverse.
B— Positive.
C— Negative.

3038. According to one theory, some forgetting is due to the practice of submerging an unpleasant experience into the subconscious. This is called

A— blanking.
B— repression.
C— interference.

3039. When the learning of similar things overshadows other learning experiences, it is called

A— correlation.
B— interference.
C— interruption.

3040. Factual data that is lost from conscious memory after several years is lost due to

A— disuse.
B— distancing.
C— interference.

3041. Responses that produce a pleasurable return are called

A— reward.
B— praise.
C— positive feedback.

A— Social.
B— Egoistic.
C— Self-fulfillment.

3044. After individuals are physically comfortable and have no fear for their safety, which human need then becomes the prime influence on their behavior?

A— Social.
B— Physical.
C— Egoistic.

3045. Before a student can concentrate on learning, which of the human needs must be satisfied?

A— Social.
B— Safety.
C— Physical.

3046. Among the various human needs, which is the individual concerned about first?

A— Safety.
B— Security.
C— Physical.

3047. Although defense mechanisms can serve a useful purpose, they can also be a hindrance because they

A— provide feelings of adequacy.
B— alleviate the cause of problems.
C— involve self-deception and distortion of reality.

3048. When a student asks irrelevant questions or refuses to participate in class activities, it usually is an indication of the defense mechanism known as

A— flight.
B— aggression.
C— resignation.

A— flight.
B— aggression.
C— rationalization.

3051. When students subconsciously use the defense mechanism called rationalization, they

A— use excuses to justify acceptable behavior.
B— cannot accept the real reasons for their behavior.
C— develop symptoms that give them excuses for removing themselves from frustration.

3052. When students become so frustrated they no longer believe it profitable or even possible to work further, they usually display which defense mechanism?

A— Aggression.
B— Resignation.
C— Rationalization.

3053. When a student becomes bewildered and lost in the advanced phase of training after completing the early phase without grasping the fundamentals, the defense mechanism is usually in the form of

A— passivity.
B— resignation.
C— rationalization.

3054. When students display the defense mechanism called aggression, they

A— become visibly angry, upset, and childish.
B— may refuse to participate in the activities of the class.
C— attempt to justify actions that otherwise would be unacceptable.

C— Covering up instructor mistakes or bluffing when the instructor is in doubt.

3057. When students are unable to see the benefits or purpose of a lesson, they will

A— be more frustrated.
B— want to learn more.
C— be further motivated.

3058. When the instructor keeps the student informed of lesson objectives and completion standards, it minimizes the student's

A— insecurity.
B— motivation.
C— aggressiveness.

3059. Student confidence tends to be destroyed if instructors

A— bluff whenever in doubt about some point.
B— identify the student's errors and failures.
C— direct and control the student's actions and behavior.

3060. Instructors who limit their thinking to the whole group without considering the individuals within that group are

A— using a good lecture technique.
B— using an excellent timesaving measure.
C— assuming all students have an average personality.

A— specialized experience.
B— up-to-date, stimulating material.
C— specialized education in effective communication.

3063. To communicate effectively, instructors must

A— have highly organized notes.
B— be authoritarian to keep the student's attention.
C— reveal a positive and confident attitude while delivering their message.

3064. Effective communication, during student instruction, has taken place when

A— information is transmitted and received.
B— the student is able to repeat the information that has been received.
C— information is provided in such a way that it changes the behavior of the student.

3065. Effective communication has taken place when, and only when, the

A— receivers react with understanding and change their behavior accordingly.
B— receiver has the ability to question and comprehend the ideas that have been transmitted.
C— sender uses a vocabulary (written or oral) that is meaningful to the reader or listener.

3066. In the communication process, the communicator will be more successful in gaining and retaining the receiver's attention by

A— being very friendly.
B— lecturing without audiovisual aids.
C— using a varied communicative approach.

they

A— control the image produced in the listener's mind.
B— call forth different mental images in the minds of the receivers.
C— will not evoke the specific items of experience in the listener's mind that the communicator intends.

3069. Probably the greatest single barrier to effective communication is the

A— use of abstractions by the communicator.
B— use of statements which contain inaccuracies.
C— lack of a common core of experience between communicator and receiver.

3070. Probably the greatest single barrier to effective communication in the teaching process is a lack of

A— respect for the instructor.
B— personality harmony between instructor and student.
C— a common experience level between the instructor and student.

3071. A communicator's words cannot communicate the desired meaning to another person unless the

A— words have meaningful referents.
B— words give the meaning that is in the mind of the receiver.
C— listener or reader has had some experience with the objects or concepts to which these words refer.

for teaching a skill such as cross-country planning?

A— Integrated instruction.
B— Demonstration/performance.
C— Presentation and application.

3074. In the teaching process, which method of presentation is suitable for presenting new material, for summarizing ideas, and for showing relationships between theory and practice?

A— Lecture method.
B— Integrated instruction method.
C— Demonstration/performance method.

3075. Evaluation of student performance and accomplishment during a lesson should be based on the

A— student's background and past experiences.
B— objectives and goals that were established in the lesson plan.
C— student's actual performance as compared to an arbitrary standard.

3076. To enhance a student's acceptance of further instruction, the instructor should

A— keep the student informed of the progress made.
B— continually prod the student to maintain motivational levels.
C— establish performance standards a little above the student's actual ability.

from the simple to complex, past to present, and known to unknown, is one that

A— creates student thought pattern departures.
B— shows the relationships of the main points of the lesson.
C— requires students to actively participate in the lesson.

3079. The proper sequence for the subparts of an introduction is

A— attention, motivation, and overview.
B— attention, development, and overview.
C— overview, motivation, and conclusion.

3080. When teaching from the known to the unknown, an instructor is using the student's

A— anxieties and insecurities.
B— previous experiences and knowledge.
C— previously held opinions both valid and invalid.

3081. In organizing lesson material, which step should relate the coverage of material to the entire course?

A— Overview.
B— Conclusion.
C— Introduction.

3082. In developing a lesson, the instructor must logically organize explanations and demonstrations to help the student

A— understand the separate items of knowledge.
B— understand the relationships of the main points of the lesson.
C— learn by rote so that performance of the procedure will become automatic.

C— Errors in grammar and vulgarisms.

3085. What is one advantage of a lecture?

A— It provides for student participation.
B— Many ideas can be presented in a short time.
C— It provides the instructor with an accurate means of monitoring student learning.

3086. When it appears students have adequately discussed the ideas presented during a guided discussion, one of the most valuable tools an instructor can use is

A— a session of verbal testing.
B— a written test on the subject discussed.
C— an interim summary of what the students accomplished.

3087. In a guided discussion, leadoff questions should usually begin with

A— why.
B— what.
C— when.

3088. Learning is produced in a guided discussion through the skillful use of

A— questions.
B— explanations.
C— demonstrations.

3089. Which statement about the guided discussion method of teaching is true?

A— Students do not need to be aware of the lesson objective.
B— Students without a background in the subject should be included in the discussion.
C— Unless the students have some knowledge to exchange with each other, they cannot reach the desired learning outcomes.

A— develop the student's verbal abilities.
B— evaluate and grade the student's knowledge.
C— bring about discussion to develop an understanding of the subject.

3092. In a guided discussion, learning is produced through

A— the skillful use of questions.
B— explanations and demonstrations.
C— discussion of a topic in which students have little or no background.

3093. Which type question should an instructor use to begin a guided discussion with a group of students?

A— Relay.
B— Direct.
C— Overhead.

3094. In the demonstration/performance method of instruction, which two separate actions are performed concurrently?

A— Instructor demonstration and evaluation.
B— Student performance and instructor supervision.
C— Instructor explanation and student demonstration.

3095. What is the last step in the demonstration/performance method?

A— Evaluation.
B— Demonstration.
C— Student performance.

the use of

A— questions.
B— visual aids.
C— negative motivations.

3098. The distinguishing characteristic of an informal lecture is the

A— use of visual aids.
B— student's participation.
C— requirement for detailed notes.

3099. Which teaching method is particularly suitable for introducing a subject and is the most economical in terms of the time required to present a given amount of material?

A— Lecture.
B— Briefing.
C— Demonstration.

3100. Which is a true statement regarding the teaching lecture?

A— Delivering the lecture in an extemporaneous manner is not recommended.
B— The teacher receives direct reaction from the student in the form of verbal or motor activity.
C— The instructor must develop a keen perception for subtle responses and must be able to interpret the meaning of these reactions.

3101. Which statement is true about an instructor's critique of a student's performance?

A— It is a step in the learning process, not in the grading process.
B— The critique should be subjective rather than objective in nature.
C— The instructor's comments and recommendations should be general rather than specific.

3103. The purpose of a critique is to

A— identify only the student's faults and weaknesses.
B— give the students a delayed evaluation of their performance.
C— provide direction and guidance to raise the level of the student's performance.

3104. When an instructor critiques a student, it should always be

A— done in private.
B— subjective rather than objective.
C— conducted immediately after the student's performance.

3105. An instructor's critique of a student's performance should

A— treat every aspect of the performance in detail.
B— be private so that the student is not embarrassed.
C— provide direction and guidance to improve performance.

3106. Which statement is true about an instructor's critique of a student's performance?

A— Praise for praise's sake is of value.
B— It should be constructive and objective.
C— It should treat every aspect of the performance in detail.

3107. To be effective, a critique should

A— place more emphasis on a student's weaknesses.
B— treat every aspect of the performance in detail.
C— be flexible enough to satisfy the requirements of the moment.

oral quizzing during a lesson?

A— Promotes active student participation.
B— Identifies points that need less emphasis.
C— Helps the instructor determine the general intelligence level of the students.

3110. During oral quizzing in a given lesson, effective questions should

A— be brief and concise.
B— relate to more than one thought or idea.
C— divert the student's thoughts to subjects covered in previous lessons.

3111. In all quizzing as a portion of the instruction process, the questions should

A— include catch questions to develop the student's perceptive power.
B— call for specific answers and be readily evaluated by the instructor.
C— include questions with more than one central idea to evaluate how completely a student understands the subject.

3112. Proper quizzing by the instructor during a lesson can have which result?

A— Identifies points which need more emphasis.
B— Encourages rote responses from the students.
C— Permits the introduction of new material which was not covered previously.

3113. One desirable result of proper oral quizzing by the instructor is to

A— reveal the effectiveness of the instructor's training procedures.
B— fulfill the requirements set forth in the overall objectives of the course.
C— reveal the essential information from which the student can determine progress.

B— have complete knowledge of the subject.
C— introduce more complicated information to fully answer the question.

3116. Which type of test item creates the greatest probability of guessing?

A— True-false.
B— Association.
C— Multiple choice.

3117. Which is the main disadvantage of supply-type (essay) test items?

A— Their high level of objectivity.
B— They cannot be graded with uniformity.
C— They are readily answered by guessing.

3118. The characteristic of a written test, which measures small differences in achievement between students, is its

A— validity.
B— reliability.
C— discrimination.

3119. A written test has validity when it

A— yields consistent results.
B— samples liberally whatever is being measured.
C— actually measures what it is supposed to measure and nothing else.

3120. Which principle should be followed in the development of true-false tests?

A— Include complex statements in the questions.
B— Avoid absolutes such as "all," "every," and "only."
C— Include one or more ideas in each statement in the questions.

A— sample liberally what is being measured.
B— include a representative and comprehensive sampling of the course objectives.
C— distinguish between the students who are low and those who are high in achievement.

3123. A written test is said to be comprehensive when it

A— includes all levels of difficulty.
B— samples liberally whatever is being measured.
C— measures knowledge of the same topic in many different ways.

3124. A written test which has reliability

A— yields consistent results.
B— measures small differences in the achievement of students.
C— actually measures what it is supposed to measure and nothing else.

3125. One of the main advantages of selection-type (multiple-choice) test items over supply-type (essay) test items is that the selection-type

A— measures the student's generalized understanding of a subject.
B— would be graded objectively regardless of the student or the grader.
C— precludes comparison of students under one instructor with those of another instructor.

3126. Which statement is true relative to effective multiple-choice test items?

A— Negative words or phrases need not be emphasized.
B— Items should call for abstract background knowledge.
C— Keep all alternatives of approximately equal length.

choice test items that are intended to measure achievement at a higher level of learning?

A— Responses involving numbers should be randomized.
B— Some or all of the alternatives should be nearly correct but only one should be clearly correct.
C— The use of common errors as distracting alternatives to divert the student from the correct response is ineffective and invalid.

3129. In a written test, which type of test items makes it easier to compare the performance of students within the same class or in different classes?

A— Supply.
B— Selection.
C— True-false.

3130. Which type test is desirable for evaluating training that involves an operation, procedure, or process?

A— Oral.
B— Written.
C— Performance.

3131. Which is a true statement concerning the use of visual aids?

A— Visual aids ensure getting and holding the student's attention.
B— Visual aids can be used to emphasize the key points in a lesson.
C— Visual aids should not be used to cover a subject in less time.

A— to concentrate on key points.
B— as a crutch by the instructor.
C— for teaching more in less time.

3134. The use of instructional aids should be based on their ability to support a specific point in the lesson. What is the first step to determine if and where instructional aids are necessary?

A— Organize subject material into an outline or a lesson plan.
B— Decide at what point in the lesson the student's interest must be rekindled.
C— Clearly establish the lesson objective, being certain what must be communicated.

3135. An instructor cannot retain the reputation of a professional if that person

A— is not paid what he or she is worth.
B— is calm, thoughtful, and disciplined.
C— does anything which implies degrading the student.

3136. The professional relationship between the instructor and the student should be based upon

A— the need to disregard the student's personal faults, interests, or problems.
B— setting the learning objectives very high so that the student is challenged continually.
C— the mutual acknowledgment that they are important to each other and both are working toward the same objective.

3138. An instructor can most effectively maintain a high level of student motivation by

A— making each lesson a pleasurable experience.
B— grading on a curve so most of the students are able to pass the course.
C— continually challenging the student to meet the highest objectives of training that can be established.

3139. What should an instructor do with a student who assumes that correction of errors is unimportant?

A— Divide complex flight maneuvers into their elements.
B— Try to reduce the student's overconfidence to reduce the chance of an accident.
C— Raise the standard of performance for each lesson, demanding greater effort.

3140. What should an instructor do if a student's slow progress is due to discouragement and a lack of confidence?

A— Provide unlimited help and encouragement.
B— Assign subgoals which can be attained more easily than the normal learning goals.
C— Raise the performance standards so that the student will gain satisfaction in meeting higher standards.

partially learn an important item of knowledge or skill.

3142. Which statement is true regarding positive or negative approaches in aviation instructional techniques?

A— A positive approach, to be effective, will point out the pleasurable features of aviation before the unpleasant possibilities are discussed.
B— The introduction of emergency procedures before the student is acquainted with normal operations is neither likely to be discouraging nor affect learning.
C— A student with a good self-image will not be affected by an instructor who emphasizes the critical aspects of flying early in training.

3143. Which is an example of a positive approach in the first flight lesson of a student with no previous aviation experience?

A— A series of simulated forced landings.
B— A normal flight to a nearby airport and return.
C— Instruction in the care which must be taken when taxiing an airplane.

3144. Should an instructor be concerned about an apt student who makes very few mistakes?

A— No; some students have an innate, natural aptitude for flying well.
B— Yes; faulty performance may soon appear due to student overconfidence.
C— Yes; the student will lose confidence in the instructor unless the instructor invents deficiencies in the student's performance.

instructor should

A— provide unlimited help and encouragement.
B— accept the slow rate of progress and accept a substandard performance.
C— have the student practice elements of the task involved until confidence and ability are gained.

3147. When a student correctly understands the situation and knows the correct procedure for the task, but fails to act at the proper time, the student most probably

A— lacks self-confidence.
B— is handicapped by indifference or lack of interest.
C— feels that the instructor is making unreasonable demands for performance and progress.

3148. What should an instructor do if a student is suspected of not fully understanding the principles involved in a task, even though the student can correctly perform the task?

A— Do not require the student to vary the performance of the maneuver at all.
B— Require the student to apply the same elements to the performance of other tasks.
C— Take the controls away from the student and give a demonstration on the practical application of the principles involved in the task.

3150. One possible indication of a student's abnormal reaction to stress would be

A— a hesitancy to act.
B— extreme overcooperation.
C— very slow changes in emotions.

3151. The instructor can counteract anxiety in a student by

A— treating the student's fears as a normal reaction.
B— discontinuing instruction in tasks that cause anxiety.
C— allowing the student to decide when he/she is ready for a new maneuver to be introduced.

3152. Which would most likely be an indication that a student is reacting abnormally to stress?

A— Slow learning.
B— Inappropriate laughter or singing.
C— Automatic response to a given situation.

3153. The basic demonstration/performance method of instruction consists of several steps in proper order. They are

A— instructor tells—student does; student tells—student does; student does—instructor evaluates.
B— instructor tells—instructor does; student tells—instructor does; student does—instructor evaluates.
C— instructor tells—instructor does; student tells—instructor does; student tells—student does; student does—instructor evaluates.

3155. The primary objective of integrated flight instruction is the

A— formation of firm habit patterns for observing and relying on flight instruments.
B— difference in the pilot's operation of the flight controls in VFR and IFR conditions.
C— developing of the habit of occasionally monitoring their own and the aircraft's performance.

3156. Which is an acceptable procedure when using the integrated method of flight instruction?

A— Use alternate and distinct periods devoted entirely to instrument flight or to visual flight.
B— Prior to the first flight, clearly explain the differences in the manipulation of flight controls for maintaining aircraft control when under simulated instrument conditions and when using references outside the aircraft.
C— Include in the student's first instruction on the function of flight controls the instrument indication to be expected, as well as the outside references used in attitude control.

3157. During integrated flight instruction, the instructor must be sure that the students

A— develop the habit of looking for other traffic.
B— can depend on the flight instruments when maneuvering by outside references.
C— are able to control the aircraft for extended periods if outside references are lost.

3158. Which obstacle to learning is a greater deterrent to learning pilot skills than is generally recognized?

A— Anxiety.
B— Impatience.
C— Physical discomfort.

possible.
B— understand the objectives toward which they are working.
C— recognize that the instructor is inadequately prepared.

3161. Students who grow impatient when learning the basic elements of a task are those who

A— are less easily discouraged than the unaggressive students.
B— should have the preliminary training presented one step at a time with clearly stated goals for each step.
C— should not be held back by insisting that the immediate goal be reached before they progress to the next step in training.

3162. Which is one of the ways in which anxiety or apprehension will affect a student?

A— Anxiety may limit the student's ability to learn from perceptions.
B— Anxiety will speed up the learning process for the student if properly controlled and directed by the instructor.
C— Anxiety causes dispersal of the student's attention over such a wide range of matters as to interfere with normal reactions.

3163. Which statement is true concerning extraneous blocks of instruction during a course of training?

A— They are usually necessary parts of the total objective.
B— They detract from the completion of the final objective.
C— They assist in the attainment of the lesson's objective.

3165. In planning any instructional activity, the first consideration should be to

A— determine the overall objectives and standards.
B— establish common ground between the instructor and student.
C— identify the blocks of learning which make up the overall objective.

3166. Each lesson of the training syllabus includes

A— attention, motivation, and overview.
B— introduction, development, and conclusion.
C— objective, content, and completion standards.

3167. In planning instructional activity, the second step is to

A— establish the overall objectives and standards.
B— develop lesson plans for each period or unit of instruction.
C— identify the blocks of learning which constitute the necessary parts of the total objective.

3168. When it is impossible to conduct a scheduled lesson, it is preferable for the instructor to

A— revise the lesson objective.
B— proceed to the next scheduled lesson, or if this is not practical, cancel the lesson.
C— conduct a lesson that is not predicated completely on skills to be developed during the lesson which was postponed.

3170. With regard to the characteristics of a well-planned lesson, each lesson should contain

A— one very basic element of a simple principle, procedure, or skill.
B— new material that is related to the lesson previously presented.
C— every bit of information needed to reach the objective of the training syllabus.

3171. In developing a lesson plan for an in-flight lesson on ground reference maneuvers, which would correctly state the true objective of the lesson?

A— "To cover the principles of planning and following a pattern. . . ."
B— "To develop the student's skill in planning and following a pattern. . . ."
C— "To explain and demonstrate the principles of planning and following a pattern. . . ."

3172. Which statement is true about lesson plans?

A— An effective lesson plan may be only a mental outline.
B— The use of a rigidly prepared lesson plan should be used for an instructional flight.
C— The lesson should contain new facts, principles, procedures, or skills related to a previous lesson.

3173. If lesson plans are constructed in a proper manner, they will provide an outline for

A— proceeding from the unknown to the known.
B— blocks of learning that become progressively larger in scope.
C— the teaching procedure to be used in a single instructional period.

3176. (Refer to figure 1.) Section B is titled:

A— Elements.
B— Blocks of Learning.
C— Course of Training.

3177. (Refer to figure 1.) Section G is titled:

A— Summary.
B— Evaluation.
C— Completion Standards.

3178. (Refer to figure 1.) Section E is titled:

A— Content.
B— Discussion.
C— Instructor's Actions.

3179. (Refer to figure 1.) Section C is titled:

A— Overview.
B— Schedule.
C— Training Schedule.

3180. (Refer to figure 1.) Section D is titled:

A— Apparatus.
B— Equipment.
C— Preparation.

3181. The layer of the atmosphere typified by relatively small changes in temperature with increased height, except for a warming trend near the top, is the

A— tropopause.
B— troposphere.
C— stratosphere.

C— lower in the summer.

3184. The tropopause is the dividing line between the

A— troposphere and ionosphere.
B— ionosphere and stratosphere.
C— troposphere and stratosphere.

3185. Which is the primary driving force of weather on the Earth?

A— The Sun.
B— Coriolis.
C— Rotation of the Earth.

3186. The average lapse rate in the troposphere is

A— 2.0° C per 1,000 feet.
B— 3.0° C per 1,000 feet.
C— 5.4° C per 1,000 feet.

3187. The most frequent type of ground- or surface-based temperature inversion is that produced by

A— terrestrial radiation on a clear, relatively still night.
B— warm air being lifted rapidly aloft in the vicinity of mountainous terrain.
C— the movement of colder air under warm air or the movement of warm air over cold air.

3188. Which weather conditions should be expected beneath a low-level temperature inversion layer when the relative humidity is high?

A— Light wind shear and poor visibility due to light rain.
B— Smooth air and poor visibility due to fog, haze, or low clouds.
C— Turbulent air and poor visibility due to fog, low stratus type clouds, and showery precipitation.

approximate freezing level?

A— 7,250 feet MSL.
B— 5,250 feet MSL.
C— 4,250 feet MSL.

3191. An altimeter indicates 1,850 feet MSL when set to 30.18. What is the approximate pressure altitude?

A— 1,590 feet.
B— 1,824 feet.
C— 2,110 feet.

3192. An aircraft is flying at a constant power setting and a constant indicated altitude. If the outside air temperature (OAT) increases, true airspeed will

A— increase and true altitude will decrease.
B— increase and true altitude will increase.
C— decrease and true altitude will increase.

3193. Density altitude may be determined by correcting

A— true altitude for nonstandard temperature.
B— pressure altitude for nonstandard temperature.
C— indicated altitude for temperature variations.

3194. What are the standard temperature and pressure values for mean sea level?

A— 15 °F and 29.92" Hg.
B— 59 °C and 29.92 mb.
C— 59 °F and 1013.2 mb.

3195. What causes wind?

A— Coriolis force.
B— Pressure differences.
C— The rotation of the Earth.

B— stronger Coriolis force at the surface.
C— friction between the wind and the surface.

3198. In the Northern Hemisphere, a pilot making a long distance flight from east to west would most likely find favorable winds associated with high- and low-pressure systems by flying to the

A— north of a high and a low.
B— north of a high and to the south of a low.
C— south of a high and to the north of a low.

3199. When flying from a high- to a low-pressure area in the Northern Hemisphere, the wind direction and velocity will be from the

A— left and increasing.
B— left and decreasing.
C— right and increasing.

3200. The general circulation of air associated with a high-pressure area in the Northern Hemisphere is

A— inward, upward, and clockwise.
B— outward, downward, and clockwise.
C— outward, upward, and counterclockwise.

3201. Which statement is true regarding high- or low-pressure systems?

A— A high-pressure area or ridge is an area of rising air.
B— A low-pressure area or trough is an area of rising air.
C— A high-pressure area is a trough of descending air.

air, as compared to the maximum amount that could exist at a given temperature, is called

A— the dewpoint.
B— saturation point.
C— relative humidity.

3204. What is the process by which ice can form on a surface directly from water vapor on a cold, clear night?

A— Sublimation.
B— Condensation.
C— Supersaturation.

3205. Which precipitation type usually indicates freezing rain at higher altitudes?

A— Snow.
B— Hail.
C— Ice pellets.

3206. When warm air moves over a cold lake, what weather phenomenon is likely to occur on the leeward side of the lake?

A— Fog.
B— Showers.
C— Cloudiness.

3207. Streamers of precipitation trailing beneath clouds but evaporating before reaching the ground are known as

A— virga.
B— sublimation.
C— evaporative.

A— source of lift.
B— stability of the air being lifted.
C— percent of moisture content of the air being lifted.

3210. The airport elevation is 1,294 feet MSL. At what elevation above mean sea level would you expect cumuliform clouds if the surface air temperature is 26 °C and the dewpoint is 21 °C?

A— 2,000 feet MSL.
B— 3,136 feet MSL.
C— 3,294 feet MSL.

3211. At approximately what altitude above the surface would you expect the base of cumuliform clouds if the surface air temperature is 77 °F and the dewpoint is 53 °F?

A— 9,600 feet AGL.
B— 8,000 feet AGL.
C— 5,500 feet AGL.

3212. At approximately what altitude above the surface would you expect the base of cumuliform clouds if the surface air temperature is 33 °C and the dewpoint is 15 °C?

A— 4,100 feet AGL.
B— 6,000 feet AGL.
C— 7,200 feet AGL.

3213. If clouds form as a result of very stable, moist air being forced to ascend a mountain slope, the clouds will be

A— cirrus type with no vertical development or turbulence.
B— cumulonimbus with considerable vertical development and heavy rains.
C— stratus type with little vertical development and little or no turbulence.

B— Altostratus lenticular.
C— Altocumulus castellanus.

3216. Consider the following air mass characteristics:

1. Cumuliform clouds.
2. Stable lapse rate.
3. Unstable lapse rate.
4. Stratiform clouds and fog.
5. Smooth air (above the friction level) and poor visibility.
6. Turbulence up to about 10,000 feet and good visibility except in areas of precipitation.

A moist air mass, which is colder than the surface over which it passes, frequently has which of the above characteristics?

A— 1, 3, and 6.
B— 3, 4, and 5.
C— 2, 4, and 5.

3217. The weather condition normally associated with unstable air is

A— stratiform clouds.
B— fair to poor visibility.
C— good visibility, except in blowing sand or snow.

3218. A moist, unstable air mass is characterized by

A— poor visibility and smooth air.
B— cumuliform clouds and showery precipitation.
C— stratiform clouds and continuous precipitation.

A— fog and drizzle.
B— showers and thunderstorms.
C— continuous heavy precipitation.

3221. What is a characteristic of stable air?

A— Excellent visibility.
B— Restricted visibility.
C— Showery-type precipitation.

3222. What type weather can one expect from moist, unstable air and very warm surface temperature?

A— Fog and low stratus clouds.
B— Continuous heavy precipitation.
C— Strong updrafts and cumulonimbus clouds.

3223. What is a typical characteristic of a stable air mass?

A— Cumuliform clouds.
B— Showery precipitation.
C— Continuous precipitation.

3224. A moist, warm air mass that is being cooled from below is characterized, in part, by

A— smooth air.
B— cumuliform clouds.
C— showers and thunderstorms.

3225. Frontal waves normally form on

A— stationary or occluded fronts.
B— slow-moving warm fronts or occluded fronts.
C— slow-moving cold fronts or stationary fronts.

the wave becoming a cold front.
B— become a warm front and that portion west of the wave would become a cold front.
C— become a cold front and that portion west of the wave would become a warm front.

3228. Which statement is true regarding a cold front occlusion?

A— The air ahead of the warm front is warmer than the air behind the overtaking cold front.
B— The air ahead of the warm front has the same temperature as the air behind the overtaking cold front.
C— The air between the warm front and cold front is colder than either the air ahead of the warm front or the air behind the overtaking cold front.

3229. Consider the following statements about mountain waves:

1. Mountain waves always develop in a series on the upwind (windward) side of mountain ridges.
2. In a mountain wave, the air dips sharply downward immediately to the lee side of a ridge, before rising and falling in a wave motion for a considerable distance downstream.
3. If the air is humid and the wave is of large amplitude, lenticular (lens-shaped) clouds mark the wave's crest.
4. In a typical wave, the greatest amplitude is seldom more than 1,000 feet above the ridge crest elevation.

From the statements above, select those which are true.

A— 2 and 3.
B— 1, 2, and 3.
C— 1, 3, and 4.

A— after a warm front has passed.
B— when surface winds are light and variable.
C— when there is a low-level temperature inversion with strong winds above the inversion.

3232. Which condition could be expected if a strong temperature inversion exists near the surface?

A— Strong, steady downdrafts and an increase in OAT.
B— A wind shear with the possibility of a sudden loss of airspeed.
C— An OAT increase or decrease with a constant wind condition.

3233. Which situation would most likely result in freezing rain?

A— Rain falling from air which has a temperature of more than 32 °F into air having a temperature of 32 °F or less.
B— Rain falling from air which has a temperature of 32 °F or less into air having a temperature of more than 32 °F.
C— Rain which has a supercooled temperature of 0 °C or less falling into air having a temperature of more than O °C.

3234. The most rapid accumulation of clear ice on an aircraft in flight may occur with temperatures between 0 °C to –15 °C in

A— cumuliform clouds.
B— stratiform clouds.
C— any clouds or dry snow.

colder.

3236. What are the minimum requirements for the formation of a thunderstorm?

A— Sufficient moisture and a lifting action.
B— Sufficient moisture, an unstable lapse rate, and lifting action.
C— Towering cumulus clouds, sufficient moisture, and a frontal zone.

3237. Select the true statement pertaining to the life cycle of a thunderstorm.

A— The initial stage of a thunderstorm is always indicated by the development of a nimbus cloud.
B— The beginning of rain at the Earth's surface indicates the mature stage of the thunderstorm.
C— The beginning of rain at the Earth's surface indicates the dissipating stage of the thunderstorm.

3238. Tornadoes are most likely to occur with which type of thunderstorms?

A— Tropical thunderstorms during the mature stage.
B— Squall line thunderstorms that form ahead of warm fronts.
C— Steady-state thunderstorms associated with cold fronts or squall lines.

3239. What feature is associated with the cumulus stage of a thunderstorm?

A— Frequent lightning.
B— Continuous updrafts.
C— Beginning of rain at the surface.

C— a fast-moving warm front.

3242. Consider the following statements regarding hail as an in-flight hazard and select those which are correct.

1. There is a correlation between the visual appearance of thunderstorms and the amount of hail within them.
2. Large hail is most commonly found in thunderstorms which have strong updrafts and large liquid water content.
3. Hail may be found at any level within a thunderstorm but not in the clear air outside of the storm cloud.
4. Hail is usually produced during the mature stage of the thunderstorm's lifespan.
5. Hailstones may be thrown upward and outward from a storm cloud for several miles.

The true statements are:

A— 2, 4, and 5.
B— 1, 2, and 3.
C— 1, 2, 4, and 5.

3243. Which statement is true concerning the in-flight hazard of hail?

A— Hail is usually produced by altocumulus clouds.
B— Rain at the surface indicates the absence of hail aloft.
C— Hailstones may be thrown outward from a storm cloud for several miles.

3244. Hail, an in-flight hazard, is most likely to be associated with

A— cumulus clouds.
B— stratocumulus clouds.
C— cumulonimbus clouds.

A— calm air.
B— visible moisture.
C— high relative humidity.

3247. Radiation fog is most likely to occur under what conditions?

A— Warm, moist air being forced upslope by light winds resulting in the air being cooled and condensed.
B— High humidity during the early evening, cool cloudless night with light winds, and favorable topography.
C— Low temperature/dewpoint spread, calm wind conditions, the presence of hydroscopic nuclei, low overcast, and favorable topography.

3248. Advection fog is formed as a result of

A— moist air moving over a colder surface.
B— the addition of moisture to a mass of cold air as it moves over a body of water.
C— the ground cooling adjacent air to the dewpoint temperature on clear, calm nights.

3249. With respect to advection fog, which statement is true?

A— It forms almost exclusively at night or near daybreak.
B— It forms when unstable air is cooled adiabatically.
C— It can appear suddenly during day or night, and it is more persistent than radiation fog.

3250. Which in-flight hazard is most commonly associated with warm fronts?

A— Ground fog.
B— Advection fog.
C— Precipitation-induced fog.

B— 10 knots per 50 miles.
C— 6 knots per 1,000 feet.

3253. Which statement is true regarding the effect of fronts on soaring conditions?

A— A slow-moving front provides the strongest lift.
B— Excellent soaring conditions usually exist in the cold air ahead of a warm front.
C— Frequently the air behind a cold front provides excellent soaring for several days.

3254. The conditions most favorable to wave formation over mountainous areas are a layer of

A— unstable air at mountaintop altitude and a wind of at least 20 MPH blowing across the ridge.
B— stable air at mountaintop altitude and a wind of at least 20 MPH blowing across the ridge.
C— moist, unstable air at mountaintop altitude and a wind of less than 5 MPH blowing across the ridge.

3255. When soaring in the vicinity of mountain ranges, the greatest potential danger from vertical and rotor-type currents will usually be encountered on the

A— leeward side when flying with the wind.
B— leeward side when flying into the wind.
C— windward side when flying into the wind.

3256. Select the true statement concerning thermals.

A— Strong thermals have proportionately increased sink in the air between them.
B— Thermals will not develop unless the Sun's rays strike the Earth at a vertical angle.
C— A thermal invariably remains directly above the surface area from which it developed.

C— –10.

3259. One method for locating thermals is to

A— fly an ever increasing circular path.
B— look for diverging streamers of dust or smoke.
C— look for converging streamers of dust or smoke.

3260. An important precaution when soaring in a dust devil is to

A— avoid the eye of the vortex because of extreme turbulence.
B— avoid steep turns on the upwind side to prevent being blown into the vortex.
C— avoid the clear area at the outside edge of the dust because of severe downdrafts.

3261. One of the best visual indications of a thermal is a

A— smooth cumulus cloud with a concave base.
B— broken to overcast sky with cumulus clouds.
C— fragmented cumulus cloud with a concave base.

3262. The most favorable type thermals for cross-country soaring may be found

A— under mountain waves.
B— along thermal streets.
C— just ahead of a warm front.

3263. Convective circulation patterns associated with sea breezes are caused by

A— land absorbing and radiating heat faster than the water.
B— warm and less dense air moving inland from over the water, causing it to rise.
C— cool and less dense air moving inland from over the water, causing it to rise.

3265. Under what condition can enough lift be found for soaring under stable weather conditions?

A— Over steep escarpments or cliffs.
B— In mountain waves that form on the upwind side of the mountains.
C— On the upwind side of hills or ridges with moderate winds present.

3266. (Refer to figure 2.) Using the sounding taken at 0900 from 2,500 feet to 15,000 feet, as shown on the Pseudo-Adiabatic Chart, what minimum surface temperature is required for instability to occur and for good thermals to develop from the surface to 15,000 feet MSL?

A— 58 °F.
B— 80 °F.
C— 90 °F.

3267. (Refer to figure 2.) At the 0900 sounding and the line plotted from the surface to 10,000 feet, what temperature must exist at the surface for instability to take place between these altitudes?

A— Any temperature more than 68 °F.
B— Any temperature less than 68 °F.
C— Any temperature between 43 °F and 68 °F.

3268. (Refer to figure 2.) According to the soundings taken at 1400, is the atmosphere stable or unstable and at what altitudes?

A— Stable from 6,000 to 10,000 feet.
B— Stable from 10,000 to 13,000 feet.
C— Unstable from 10,000 to 13,000 feet.

3269. (Refer to figure 2.) Using the 1400 soundings, does an inversion exist and, if so, at what altitudes?

A— No; there is no inversion shown.
B— Yes; between 10,000 and 13,000 feet.
C— Yes; between 13,000 and 15,000 feet.

B— FTW.
C— TYR.

3272. (Refer to figure 3.) What is the reported duration of the rain at the time of the observation at AUS?

A— 25 minutes.
B— 26 minutes.
C— 36 minutes.

3273. (Refer to figure 3.) What does the LB26E40 mean at the end of the report for AMA?

A— Drizzle began at 26 past the hour and ended at 40 past the hour.
B— Lightning began at 1726 with 40 percent coverage of radar echoes.
C— There are large buildups to the east with wind gusting 26 to 40 knots.

3274. (Refer to figure 3.) Which station is reporting the lowest visibility?

A— AUS.
B— FTW.
C— TYR.

3275. (Refer to figure 3.) The altimeter setting at AUS is

A— 1016.9 mb.
B— 30.05" Hg.
C— 31.69" Hg.

3276. (Refer to figure 3.) In the report for BKO, what is the reported ceiling?

A— 2,000 feet.
B— 13,000 feet.
C— 25,000 feet.

RADAT 88M018055097/2.

How many crossings of the zero degree Celsius isotherm have occurred?

A— 5.
B— 4.
C— 3.

3279. GIVEN:

OUN AMOS 36/26/3618/007 PK WIND 27 024.

The 024 indicates

A— the peak wind occurred 24 minutes past the hour.
B— 24 hundredths of an inch of liquid precipitation since the last observation.
C— a drop of 24 hundredths of an inch of mercury in the altimeter setting in the last hour.

3280. Interpret the following radar weather report:

LIT 1133 AREA 4TRW 22/100 88/170 196/180 220/115 C2425 MT 310 AT 162/110

A— There are four cells with tops at 10,000 feet, 17,000 feet, and 11,500 feet.
B— The maximum top of the cells is located 162° and 110 NM from the station (LIT).
C— The visibility is 4 miles in thunderstorms and the intensity of thunderstorms remains unchanged.

3282. (Refer to figure 4.) Which is a true statement?

A— It is clear above 8,500 feet at DAL.
B— There are moderate buildups west of ABI.
C— The pilot reported a north wind at 30 knots at BRO.

3283. (Refer to figure 4.) Turbulence was reported west of

A— AUS.
B— ABI.
C— BRO.

3284. (Refer to figure 4.) Which is the true statement?

A— Thunderstorms were reported north of BRO.
B— Moderate turbulence was reported by a pilot east of ABI.
C— The base of the overcast at AUS was reported to be 13,000 feet.

3285. (Refer to figure 4.) The lowest cloud base reported is

A— 500 feet at BRO.
B— 4,500 feet at DAL.
C— 5,000 feet at BRO.

3286. (Refer to figure 5.) What is the visibility forecast for BRO?

A— 1 mile.
B— 3 miles.
C— Greater than 6 miles.

entire forecast period?

A— ABI.
B— ACT.
C— AUS and ACT.

3289. (Refer to figure 5.) The valid time for the forecasts is from

A— 0940Z on the 30th until 0940Z the following day.
B— 1010Z on the 30th until 1000Z the following day.
C— 1000Z on the 30th until 1000Z on the following day.

3290. (Refer to figure 5.) What is the lowest ceiling forecast for ABI?

A— 1,000 feet.
B— 1,400 feet.
C— 10,000 feet.

3291. To determine the freezing level and areas of probable icing aloft, you should refer to the

A— Area Forecast.
B— Weather Depiction Chart.
C— Surface Analysis Weather Chart.

3292. For a brief summary of the location and movement of fronts, pressure systems, and circulation patterns, the pilot should refer to the

A— Area Forecast.
B— Stability Chart.
C— Radar Summary Chart.

A— 12 hours with an additional 6 hours categorical outlook.
B— 12 hours with an additional 12 hours categorical outlook.
C— 18 hours with an additional 12 hours categorical outlook.

3295. (Refer to figure 6.) What is the forecast for northwestern Alabama after 2300Z?

A— IFR with widely scattered thunderstorms.
B— Ceilings of 1,000 to 3,000 feet and/or visibility of 3 to 5 miles with possible rain showers.
C— Ceilings below 1,000 feet and visibility restricted to 3 miles by light rain and fog.

3296. (Refer to figure 6.) This forecast is valid for

A— 24 hours with an additional 12-hour outlook.
B— 18 hours with an additional 12-hour outlook.
C— 12 hours with an additional 6-hour outlook.

3297. (Refer to figure 6.) What is the forecast visibility for south-central Texas for the period ending 2300Z?

A— 3 miles.
B— More than 6 miles.
C— This visibility is not forecast.

3298. (Refer to figure 6.) The lowest layer of clouds forecast for Oklahoma is

A— 100 feet AGL.
B— below 1,000 feet MSL.
C— below 1,000 feet AGL.

3299. What information would be covered in an AIRMET?

A— Severe turbulence.
B— Extensive mountain obscurement.
C— Hail of 3/4 inch or greater diameter.

greater than 40 knots.
B— Tornadoes, embedded thunderstorms, and hail 3/4 inch or greater in diameter.
C— Severe icing, severe turbulence, or widespread dust storms lowering visibility to less than 3 miles.

3302. (Refer to figure 7.) What is the temperature for 6,000 feet at AMA?

A— 8 °C.
B— The temperature is standard for that altitude.
C— No temperatures are forecast for levels within 2,500 feet of station elevation.

3303. (Refer to figure 7.) Why is there no wind forecast for 3,000 and 6,000 feet at ABQ?

A— Wind which is expected to be light and variable is omitted.
B— No winds are forecast within 1,500 feet of station elevation.
C— No winds are forecast within 3,000 feet of station elevation.

3304. (Refer to figure 7.) What is the forecast wind for 12,000 feet at AMA?

A— Calm.
B— Light and variable.
C— 090° in excess of 50 knots.

3305. (Refer to figure 7.) What is the temperature at 30,000 feet for DAL?

A— +40 °C.
B— –40 °C.
C— –40 °F.

C— 080° at 10 knots.

3308. By referring to the isobars on a Surface Analysis Weather Chart, what can a person determine?

A— Pressure gradient.
B— Temperature changes.
C— Areas of precipitation.

3309. The intensity trend of a front (as of chart time) is best determined by referring to a

A— Surface Analysis.
B— Radar Summary Chart.
C— Weather Depiction Chart.

3310. (Refer to figure 8.) What does this symbol mean on a Surface Analysis Weather Chart?

A— Squall line.
B— Occluded front.
C— High-pressure ridge.

3311. (Refer to figure 9.) Which symbol used on a Surface Analysis Weather Chart represents a dissipating warm front?

A— 1.
B— 2.
C— 3.

3312. (Refer to figure 10.) On a Weather Depiction Chart, what does this information mean?

A— Visibility 5 miles, sky obscured.
B— Visibility 5 miles, haze, overcast, ceiling 3,500 feet.
C— Visibility 3 to 5 miles, sky obscured, ceiling 5,000 feet.

pilot in determining

A— the temperature and dewpoint at selected stations.
B— the forecast areas of cloud cover and precipitation.
C— areas where weather conditions were reported above or below VFR minimums.

3315. (Refer to figure 11.) On a Weather Depiction Chart, what does this information mean?

A— Visibility one-half mile, 200 feet overcast, smoke.
B— Visibility 2 miles, sky obscured, haze, ceiling 2,000 feet.
C— Visibility 2 miles, sky obscured, fog, cloud layer at 20,000 feet.

3316. (Refer to figure 12.) The Weather Depiction Chart indicates that the coastal sections of Texas and Louisiana are reporting

A— marginal VFR conditions due to broken ceilings of 2,000 feet.
B— VFR conditions with scattered clouds at 2,000 feet and higher cirriform.
C— all ceilings at or above 20,000 feet with visibilities of 20 miles or more.

3317. (Refer to figure 12.) The Weather Depiction Chart indicates the heaviest precipitation along the front is occurring in

A— Kansas.
B— Missouri.
C— Illinois.

3319. (Refer to figure 12.) The Weather Depiction Chart indicates that most of Virginia is reporting

A— marginal VFR conditions due to extensive low ceilings.
B— IFR conditions due to very low visibilities and frontal buildups.
C— marginal VFR conditions due to reduced visibilities in fog and haze.

3320. (Refer to figure 12.) What restrictions to visibility are depicted in western Iowa?

A— Drizzle.
B— Fog, rain, and haze.
C— Drizzle, fog, and rain.

3321. (Refer to figure 13.) What is the direction and speed of movement of the line that extends from southwestern Nebraska to east-central Minnesota?

A— Northeast at 50 knots.
B— Southeast at 22 knots.
C— Northeast at 30 knots.

3322. (Refer to figure 13.) What is the VIP level of area A?

A— 2.
B— 3.
C— 5.

3323. (Refer to figure 13.) What does the 280 in area C mean?

A— The base of the clouds is 2,800 feet MSL.
B— Coverage of precipitation is 28.0 percent.
C— The highest top of precipitation is 28,000 feet MSL.

stations.
C— areas of clouds, ceiling heights, and intensity of freezing precipitation.

3326. (Refer to figure 14.) Which area(s) should have the lowest ceilings at 1800Z?

A— The area just ahead of the cold front.
B— The area extending from northern Kansas to western Wisconsin.
C— The areas where precipitation is expected to occur, east of the cold front and west of the warm front.

3327. (Refer to figure 14.) Where is snow expected at 1800Z?

A— Northern Oregon and Washington.
B— In the central Great Lakes area.
C— From northwest Kansas to the Great Lakes and from northwest Colorado northward to Canada.

3328. (Refer to figure 14.) What type precipitation is expected in eastern Arkansas at 1800Z?

A— Rain showers over the entire area.
B— Continuous rain over the entire area.
C— Rain showers and thunderstorms affecting .5 or more of the area.

3329. (Refer to figure 14.) At what altitude is the freezing level in central Oklahoma as forecast on the 24-hour Significant Weather Prog?

A— 4,000 feet MSL.
B— 5,000 feet MSL.
C— 6,000 feet MSL.

B— Surface Analysis.
C— Weather Depiction.

3332. Which is an operational consideration concerning U.S. Low-Level Significant Weather Prognostic Charts?

A— The charts are designed for use in domestic flight planning to 24,000 feet.
B— This is a four-panel chart that forecasts the weather for a period of 48 hours.
C— The valid time of the charts corresponds to the time of the plotted observations and they are not forecasts.

3333. (Refer to figure 15.) This High-Level Significant Weather Prognostic Chart encompasses airspace from

A— FL240 to FL630.
B— 20,000 feet MSL to FL610.
C— 10,000 feet MSL to 51,000 feet MSL.

3334. (Refer to figure 15.) The 340 in a rectangle, at area A, means the forecast

A— height of the tropopause in millibars.
B— highest altitude for turbulence in that area.
C— height of the tropopause in hundreds of feet MSL.

3335. (Refer to figure 15.) What is the type and intensity of the forecast turbulence in area B?

A— Clear air turbulence, light to severe in intensity.
B— Convective turbulence, light to moderate in intensity.
C— Clear air turbulence, moderate to severe in intensity.

C— Less than 1/8.

3338. (Refer to figure 15.) In area F, what is the significance of the numbers 510 over the 3 X's?

A— Cloud bases are forecast to be from 18,000 feet MSL to 51,000 feet MSL.
B— Cloud bases are forecast to be below FL240 and the tops are forecast to reach FL510.
C— Turbulence is forecast to be severe from 24,000 feet MSL to 51,000 feet MSL.

3339. (Refer to figure 16.) What percent coverage of severe thunderstorms is forecast to occur in the area of moderate risk in the north-central United States?

A— 6 to 10 percent.
B— 10 to 50 percent.
C— 50 to 90 percent.

3340. If an area on a Severe Weather Outlook Chart is labeled APCHG, this indicates

A— possible tornadoes.
B— thunderstorm activity may approach extreme intensity.
C— winds greater than or equal to 35 knots but less than 50 knots.

3341. (Refer to figure 16.) A crosshatched area on the Severe Weather Outlook Chart indicates a

A— current tornado watch area.
B— severe weather outlook area.
C— forecast severe thunderstorm watch area.

arrow C on the Stability Chart?

A— Unstable air; instability, showers, and thunderstorms.
B— Neutral stability; stratus clouds and light precipitation.
C— Moderately saturated air; steady precipitation and light turbulence.

3344. (Refer to figure 17.) What are the probable weather conditions in the area indicated by arrow D on the Stability Chart?

A— Stable air; predominately fair.
B— High relative humidity; showers and thunderstorms.
C— Marginally unstable air; moderate turbulence and possible thunderstorms.

3345. (Refer to figure 17.) Which symbol on the Stability Chart signifies very stable air and no precipitation?

A— $\frac{23}{-15}$
B— $\frac{-3}{34}$
C— $\frac{0}{35}$

3346. From which of the following can the observed temperature, wind, and temperature/dewpoint spread be determined at specified flight levels?

A— Stability Charts.
B— Winds Aloft Forecasts.
C— Constant Pressure Charts.

hour.
B— Five minutes with maximum winds lasting approximately 2 to 4 minutes.
C— Seldom longer than 15 minutes from the time the burst strikes the ground until dissipation.

3349. Maximum downdrafts in a microburst encounter may be as strong as

A— 6,000 feet per minute.
B— 4,500 feet per minute.
C— 1,500 feet per minute.

3350. How long do the maximum intensity winds last in an individual microburst?

A— 2 to 4 minutes.
B— 5 to 10 minutes.
C— 15 minutes.

3351. What document(s) must you have in your personal possession while operating as pilot in command of an aircraft?

A— An appropriate pilot certificate and a current medical certificate.
B— A certificate showing accomplishment of a checkout in the aircraft and a current flight review.
C— A pilot logbook with endorsements showing accomplishment of a current flight review and recency of experience.

3352. A person whose Flight Instructor Certificate has been suspended may not

A— give flight instruction, but may apply for a rating to be added to that certificate.
B— apply for any rating to be added to that certificate during the period of suspension.
C— apply for any Flight Instructor Certificate for a period of 1 year after the date of the suspension.

3354. What is the duration of a Student Pilot Certificate?

A— Indefinite.
B— 12 months after the month in which it was issued.
C— 24 months after the month in which it was issued.

3355. What is the duration of a Flight Instructor Certificate?

A— Indefinite, unless suspended or revoked.
B— 24 months after the month in which it was issued or renewed.
C— Indefinite, as long as the holder has a current pilot and medical certificate appropriate to the pilot privileges being exercised.

3356. A Third-Class Medical Certificate was issued on May 3. To exercise the privileges of a Private Pilot Certificate, the medical certificate will be valid through

A— May 3, 24 months later.
B— May 31, 12 months later.
C— May 31, 24 months later.

3357. A Second-Class Medical Certificate issued January 18 of this year will expire

A— January 18 of next year for private pilot privileges.
B— January 31 of next year for commercial pilot privileges.
C— January 31, 2 years later for commercial pilot privileges.

3358. To act as pilot in command of an airplane that has more than 200 horsepower, a person holding a Private or Commercial Pilot Certificate is required to

A— pass a flight test in such an airplane.
B— make three solo takeoffs and landings in such an airplane.
C— receive flight instruction in an airplane that has more than 200 horsepower.

3360. Unless otherwise authorized, a pilot in command is required to possess a type rating for that airplane when operating any

A— airplane with a gross weight in excess of 6,000 pounds.
B— airplane with a gross weight in excess of 12,500 pounds.
C— multiengine airplane with a gross weight in excess of 6,000 pounds.

3361. To act as pilot in command of a high performance airplane, a person holding a Private or Commercial Pilot Certificate is required to

A— complete a practical test in such an airplane.
B— have made at least three takeoffs and landings in such an airplane in the last 90 days.
C— receive flight instruction in such an airplane and obtain a logbook endorsement of competency.

3362. To be eligible (in part) to take an FAA written test, an applicant must show proof of

A— medical qualification appropriate to the certificate being sought.
B— meeting the minimum age requirement for the issuance of the certificate being sought.
C— satisfactory completion of the appropriate ground instruction or home study course.

24 months before taking any written test.
B— That person may be required to wait a maximum of 6 months before taking any written test.
C— Any airman or ground instructor certificate or rating held may be suspended or revoked.

3365. What class medical certificate, if any, is required for a person adding a rating to a pilot certificate?

A— None.
B— Second-Class.
C— Third-Class.

3366. A written statement from an appropriately rated flight instructor certifying that an applicant has received the required instruction in preparation for a flight test must be dated within a minimum of how many days preceding the date of application?

A— 60 days.
B— 90 days.
C— 120 days.

3367. To be eligible for a practical test under FAR Part 61, an applicant is required to have passed the appropriate written test within the preceding

A— 6 calendar months.
B— 12 calendar months.
C— 24 calendar months.

3368. An applicant has failed a pilot written test for the second time. That applicant may apply for a retest after how many days?

A— 5.
B— 10.
C— 30.

3370. An applicant who fails a practical test for the second time may apply for retesting after

A— 30 days have passed.
B— receiving 5 hours of appropriate instruction.
C— presenting a letter of competency to the examiner signed by a current flight instructor.

3371. Which instruction time must be certified by the instructor from whom it was received?

A— Flight instruction.
B— Flight instruction and ground trainer instruction.
C— Flight instruction, pilot ground trainer instruction, and ground instruction.

3372. What flight time must be shown, in a reliable record, by a pilot exercising the privileges of a commercial certificate?

A— All flight time.
B— All flight time flown with passengers aboard the aircraft.
C— Only the flight time necessary to meet the recent experience requirements.

3373. Which operation requires a recreational pilot to carry his or her logbook?

A— When flying during the hours of sunrise to sunset.
B— In airspace requiring communications with air traffic control.
C— Any solo flight up to 50 miles from the airport or point of departure.

3374. An annual flight review is required for all

A— recreational pilots, regardless of flight time.
B— non-instrument rated private pilots with less than 400 hours' flight time.
C— non-instrument rated commercial pilots acting as pilot in command.

required proficiency check within the prescribed time is

A— not authorized to fly solo.
B— authorized to fly solo only.
C— not authorized to give instruction except to holders of Recreational Pilot Certificates.

3377. An annual flight review for a glider pilot with less than 400 hours' flight time must consist of at least 1 hour of ground instruction and

A— three takeoffs and landings.
B— three flights, each of which includes a 360° turn.
C— 1 hour of flight instruction to include three 360° turns.

3378. What recent flight experience must be met before a commercial airplane pilot may fly solo in an airplane?

A— Three takeoffs and three landings within the preceding 90 days in an airplane.
B— Satisfactorily accomplished a flight review in any aircraft for which rated, within the preceding 24 calendar months.
C— Satisfactorily accomplished a flight review within the preceding 24 calendar months, but this review must be in an airplane.

3379. To meet the recent flight experience requirements for acting as pilot in command carrying passengers at night, a pilot must have made, within the preceding 90 days and from 1 hour after sunset to 1 hour before sunrise, three takeoffs and three landings to a full stop in

A— the same category of aircraft to be used.
B— the same category and class of aircraft to be used.
C— the same category, class, and, if a type rating is required, the same type of aircraft to be used.

3381. If recency of experience requirements for night flight are not met and official sunset is 1830, the latest time passengers may be carried is

A— 1829.
B— 1859.
C— 1929.

3382. The holder of a pilot certificate who fails to notify the FAA Airmen Certification Branch in writing of a change in permanent mailing address may exercise the privileges of that pilot certificate for how many days after date of change?

A— 30.
B— 60.
C— 90.

3383. When a permanent change of address occurs, pilot privileges may not be exercised unless the FAA Airmen Certification Branch is notified, in writing, within

A— 30 days.
B— 60 days.
C— 90 days.

3384. A person seeking a private pilot glider rating is exempt from taking the written examination if that person

A— holds a rating for powered aircraft.
B— holds a pilot certificate for any category.
C— has taken a written examination for any powered rating within the preceding 24 months.

Certificate limited to helicopters is required to be at least how old?

A— 16 years.
B— 17 years.
C— 18 years.

3387. To be eligible for a Student Pilot Certificate limited to airplanes, an applicant is required to be at least how old?

A— 14 years.
B— 16 years.
C— 17 years.

3388. What is the minimum age requirement for the applicant who is seeking a Student Pilot Certificate limited to gyroplane operations?

A— 14 years.
B— 16 years.
C— 18 years.

3389. The minimum age requirement for the applicant who is seeking a Student Pilot Certificate limited to glider operations is

A— 17 years.
B— 16 years.
C— 14 years.

180 days that instruction was given in the make of aircraft to be soloed and that the instructor found the applicant competent to make a safe flight in that aircraft.

3391. Prior to a first solo flight, the flight instructor is required to endorse the student's

A— logbook.
B— pilot certificate.
C— logbook and pilot certificate.

3392. A student is required to have his/her pilot certificate endorsed by a flight instructor for each

A— solo flight.
B— solo cross-country flight.
C— make and model of aircraft to be flown solo.

3393. Who is responsible for writing and grading the written test that each student must take prior to solo flight?

A— Any certified ground instructor.
B— FAA Airman Certification Branch in Oklahoma City.
C— Flight instructor who will endorse the student's pilot certificate.

3394. What subjects must be covered on the presolo written test?

A— Principles of flight, weather, and aircraft systems.
B— Applicable regulations, flight characteristics, and operational limitations of make and model aircraft to be flown.
C— Density altitude, operations from a controlled airport, and radio communications with appropriate air traffic control facilities.

A— 20 NM.
B— 25 NM.
C— 50 NM.

3397. Are students authorized to make repeated solo cross-country flights without each flight being logbook endorsed?

A— No; each solo cross-country flight requires a logbook endorsement.
B— Yes; provided the flights take place under stipulated conditions.
C— Yes; but only if the flights remain within 25 NM of the point of departure.

3398. One requirement for a student pilot to be authorized to make a solo cross-country flight is an endorsement

A— in the student's logbook that the instructor has given the student cross-country instruction in the model of aircraft to be used.
B— in the student's logbook that the preflight planning and preparation has been reviewed and the student is prepared to make the flight safely.
C— on the Student Pilot Certificate stating the student is competent to make cross-country flights in the category, class, and type of aircraft involved.

has received at least 3 hours of cross-country instruction and logged at least 5 hours of solo cross-country flight.

3400. To operate an aircraft on a solo flight within a terminal control area, a student must have a logbook endorsement showing that he/she has

A— received flight instruction from any authorized flight instructor on operating within a terminal control area.
B— received ground instruction on and flight instruction in the specific terminal control area for which solo flight is authorized.
C— within the preceding 90 days, been found to be competent by any flight instructor having knowledge of the student's experience.

3401. What night flight instruction is required for an unrestricted Private Pilot Certificate with an airplane rating?

A— 3 hours at night, including 10 takeoffs and 10 landings.
B— 1 hour at night, including five takeoffs and five landings.
C— 1 hour at night, including three takeoffs and three landings.

3402. With respect to cross-country experience requirements in FAR Part 61, a private pilot–airplane applicant must have a minimum of

A— 3 hours' dual and 5 hours' solo.
B— 3 hours' dual and 10 hours' solo.
C— 5 hours' dual and 10 hours' solo.

3403. What is the minimum age required to be eligible for a Recreational Pilot Certificate with an airplane rating?

A— 17.
B— 16.
C— 14.

A— logged pilot-in-command time in the last 90 days.
B— logged pilot-in-command time in the last 180 days.
C— received flight instruction from an instructor who certifies the pilot is competent to conduct flights beyond 50 miles.

3406. To act as pilot in command of an airplane in a passenger-carrying airlift sponsored by a charitable organization, a private pilot is required to have

A— special authorization from the FAA.
B— logged at least 200 hours of flight time.
C— at least 100 hours of pilot-in-command time.

3407. What flight time is required for a Private Pilot Certificate with a helicopter rating?

A— A minimum of 40 hours in helicopters with at least 15 hours of solo time.
B— A minimum of 40 hours of flight time in aircraft with at least 15 hours of flight instruction in helicopters.
C— A minimum of 40 hours of flight instruction and solo flight time in aircraft with at least 15 hours of solo time in helicopters.

3408. How much solo time in a gyroplane is required to be eligible for a Private Pilot Certificate with a gyroplane rating?

A— 10 hours.
B— 15 hours.
C— 20 hours.

3409. What is the minimum age required to be eligible for a Commercial Pilot Certificate?

A— 17.
B— 18.
C— 21.

A— 250 hours.
B— 200 hours.
C— 150 hours.

3412. Under FAR Part 61, a commercial pilot–airplane applicant is required to have a minimum of how much cross-country experience?

A— 30 hours.
B— 40 hours.
C— 50 hours.

3413. What limitation is imposed on a newly certificated commercial airplane pilot if that person does not hold an instrument pilot rating?

A— The carrying of passengers for hire on cross-country flights of more than 50 NM or at night is prohibited.
B— The carrying of passengers for hire on cross-country flights is limited to 50 NM for night flights, but not limited for day flights.
C— The carrying of passengers or property for hire on cross-country flights is limited to 50 NM and the carrying of passengers for hire at night is prohibited.

3414. As pilot, how much flight time should an applicant have for a Commercial Pilot Certificate with a helicopter rating?

A— 250 hours.
B— 200 hours.
C— 150 hours.

3415. As pilot, how much flight time should an applicant have for a Commercial Pilot Certificate with a gyroplane rating?

A— 150 hours.
B— 200 hours.
C— 250 hours.

were made.

3417. What requirement must a certified airplane flight instructor meet in order to prepare an applicant for a Flight Instructor Certificate?

A— Have logged a minimum of 100 hours of flight instructor time.
B— Have held a Flight Instructor Certificate for at least 12 months immediately preceding the date the instruction is given.
C— Have held a Flight Instructor Certificate for at least 24 months and given a minimum of 200 hours of flight instruction.

3418. What requirement must a certified glider flight instructor meet in order to prepare an applicant for a Flight Instructor Certificate with a glider rating?

A— Have held a Flight Instructor Certificate for 24 months or given 200 hours of flight instruction.
B— Have held a Flight Instructor Certificate for 12 months and given a minimum of 80 hours of instruction.
C— Have held a Flight Instructor Certificate for at least 24 months and given a minimum of 80 hours of glider instruction.

3419. The type and date of each student pilot endorsement given shall be maintained by each flight instructor. For what period of time is this record required to be maintained?

A— 6 months.
B— 24 months.
C— 36 months.

time?

A— 8.
B— 10.
C— 12.

3422. To endorse a student pilot for solo cross-country privileges, an instructor is required, in part, to have

A— given that student the required cross-country flight instruction.
B— assurance from another instructor that the student is prepared to conduct the flight safely.
C— at least 5 hours of experience as pilot in command in the make and model aircraft involved.

3423. To endorse a student pilot's logbook for local solo flight, an instructor is required, in part, to have

A— given that student cross-country flight instruction.
B— given that student flight instruction in the type of aircraft involved.
C— at least 5 hours of experience as pilot in command in the aircraft involved.

3424. Certain flight instruction is required for the issuance of a certificate. If that instruction is in a multiengine airplane, the instructor is required, in part, to have

A— given at least 200 hours of flight instruction.
B— given at least 100 hours of instruction in multiengine aircraft.
C— at least 5 hours of experience as pilot in command in the make and model of aircraft involved.

3426. The holder of an expired Flight Instructor Certificate may exchange that certificate for a new one by

A— passing the appropriate practical test.
B— presenting a satisfactory record of instruction.
C— successfully completing a flight instructor refresher course.

3427. A Flight Instructor Certificate may be renewed by

A— passing both a written and a practical test.
B— successfully completing a flight instructor refresher course within 6 months prior to renewal.
C— providing a record of instruction showing evidence the applicant is a competent flight instructor.

3428. If an in-flight emergency requires immediate action, a pilot in command may

A— deviate from FAR's to the extent required to meet that emergency.
B— not deviate from FAR's unless permission is obtained from air traffic control.
C— deviate from FAR's to the extent required to meet the emergency, but must submit a written report to the Administrator within 24 hours.

3429. Under what condition, if any, may a pilot allow a person who is obviously under the influence of intoxicating liquors or drugs to be carried aboard an aircraft?

A— Under no condition.
B— Only if a second pilot is aboard.
C— Only if the person is a medical patient under proper care or in an emergency.

B— .04 percent or greater.
C— 0.2 percent or greater.

3432. An aircraft's operating limitations may be found in the

A— FAA-approved aircraft flight manual.
B— owner's handbook published by the aircraft manufacturer.
C— aircraft flight manual, approved manual material, markings, and placards, or any combination thereof.

3433. In addition to other preflight action for a VFR cross-country flight, regulations specifically require the pilot in command to

A— file a flight plan for the proposed flight.
B— determine runway lengths at the airports of intended use.
C— check the accuracy of the omninavigational equipment if the flight is to be made on airways.

3434. Which preflight action is required for every flight?

A— Check weather reports and forecasts.
B— Determine runway length at airports of intended use.
C— Determine alternatives if the flight cannot be completed.

3435. The preflight action required by regulations relative to alternatives available, if the planned flight cannot be completed, is applicable to

A— IFR flights only.
B— any flight not in the vicinity of an airport.
C— any flight conducted for hire or compensation.

required crewmember's seatbelt must be fastened at all times while occupying an assigned station.

3437. A pilot in a multiengine land airplane is planning to practice IFR procedures under a hood in VMC conditions. The safety pilot must have at least a

A— Student Pilot Certificate.
B— Private Pilot Certificate, with airplane multiengine land rating.
C— Private Pilot Certificate with both airplane and instrument ratings.

3438. May an airplane be operated in formation flight while passengers are carried for hire?

A— No; this is not authorized.
B— Yes; if the passengers approve.
C— Yes; provided arrangements have been made with the other pilot(s).

3439. If on a night flight, the pilot of airplane A observes only the green wingtip light of airplane B, and the airplanes are converging, which airplane has the right-of-way?

A— Airplane A; it is to the left of airplane B.
B— Airplane B; it is to the right of airplane A.
C— Airplane A; it is to the right of airplane B.

3440. When two or more airplanes are approaching an airport for the purpose of landing, the right-of-way belongs to the airplane

A— that is the least maneuverable.
B— that is either ahead of or to the other's right regardless of altitude.
C— at the lower altitude, but it shall not take advantage of this rule to cut in front of or to overtake another.

airspeed authorized is

A— 156 knots.
B— 200 knots.
C— 250 knots.

3443. Unless otherwise authorized, what is the maximum speed at which a turbine-powered aircraft should be flown within an airport traffic area which is in a terminal control area?

A— 156 knots.
B— 200 knots.
C— 250 knots.

3444. Unless otherwise authorized or required by air traffic control, what is the maximum indicated airspeed at which a person may operate an aircraft below 10,000 feet MSL?

A— 156 knots.
B— 200 knots.
C— 250 knots.

3445. The maximum indicated airspeed permitted when operating an aircraft within an airport traffic area located outside a terminal control area is

A— 156 knots.
B— 200 knots.
C— 250 knots.

3446. To operate an aircraft over any congested area, a pilot should maintain an altitude of at least

A— 500 feet above the highest obstacle within a horizontal radius of 1,000 feet.
B— 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet.
C— 2,000 feet above the highest obstacle within a horizontal radius of 1,000 feet.

A— An altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet.
B— An altitude of 500 feet above the surface and no closer than 500 feet to any person, vessel, vehicle, or structure.
C— An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

3449. A helicopter may be operated at less than the minimum safe altitudes prescribed by regulations for other aircraft if

A— the operation is conducted without hazard to persons or property.
B— an altitude of at least 500 feet is maintained over other than congested areas.
C— at least 500 feet is maintained above the highest obstacle within a radius of 1,000 feet.

3450. What action is appropriate if you deviate from an air traffic control instruction during an emergency and are given priority?

A— Submit a report to the nearest FAA regional office within 48 hours.
B— Submit a report to the manager of the air traffic control facility within 24 hours.
C— If requested, submit a detailed report within 48 hours to the manager of the air traffic control facility.

3451. While in flight, a steady red light directed at you from the control tower means

A— continue flight; airport unsafe, do not land.
B— give way to other aircraft; continue circling.
C— return for landing; expect steady green light at the appropriate time.

A— Taxi clear of the runway in use.
B— Return to your starting point on the airport.
C— None; this light signal is applicable only to aircraft in flight.

3454. What is the correct departure procedure at a noncontrolled airport?

A— The FAA-approved departure procedure for that airport.
B— Make all left turns, except a 45° right turn on the first crosswind leg.
C— Departure in any direction consistent with safety, after crossing the airport boundary.

3455. A turbine-powered or large airplane is required to enter an airport traffic area at an altitude of at least

A— 1,000 feet AGL.
B— 1,500 feet AGL.
C— 2,000 feet AGL.

3456. An airport without a control tower lies within the airport traffic area of an airport that has an operating tower. According to regulations, air traffic control authorization is required to land at

A— both airports, as well as to fly through the area.
B— the tower-controlled airport only, as well as to fly through the area.
C— the tower-controlled airport only, but not required to fly through the area.

3457. Which of the following is required for flight within a terminal control area?

A— Private Pilot Certificate.
B— Distance measuring equipment.
C— A 4096 code transponder with automatic altitude reporting capability.

terminal control area?

A— A 4096 code transponder.
B— A 4096 code transponder with altitude reporting capability.
C— A VOR receiver and distance measuring equipment.

3460. In which type of airspace are VFR flights prohibited?

A— Terminal control area.
B— Positive control area.
C— Continental Control Area.

3461. What is the minimum fuel requirement for flight under VFR at night in an airplane? Enough to fly to

A— the first point of intended landing and to fly after that for 20 minutes at normal cruise speed.
B— the first point of intended landing and to fly after that for 30 minutes at normal cruise speed.
C— the first point of intended landing and to fly after that for 45 minutes at normal cruise speed.

3462. What is the minimum fuel requirement for flight under VFR during daylight hours in an airplane? Enough to fly to

A— the first point of intended landing and to fly after that for 20 minutes at normal cruise speed.
B— the first point of intended landing and to fly after that for 30 minutes at normal cruise speed.
C— the first point of intended landing and to fly after that for 45 minutes at normal cruise speed.

3464. What type airspeed at the planned cruise altitude should be entered on a flight plan?

A— True airspeed.
B— Indicated airspeed.
C— Estimated groundspeed.

3465. An airplane may be operated in uncontrolled airspace at night below 1,200 feet above the surface under the following conditions:

A— Clear of clouds and 1 mile visibility.
B— Clear of clouds and 3 miles visibility.
C— Less than 3 miles but more than 1 mile visibility in an airport traffic pattern and within one-half mile of the runway.

3466. During VFR operations outside controlled airspace at altitudes of less than 1,200 feet AGL, what is the minimum distance from clouds requirement?

A— Remain clear of clouds.
B— 500 feet above or 1,000 feet below and 2,000 feet horizontal.
C— 500 feet above or 500 feet below and 1,000 feet horizontal.

3467. During operations within controlled airspace at altitudes of more than 1,200 feet AGL, but less than 10,000 feet MSL, the minimum horizontal distance from clouds requirement for VFR flight is

A— 2,000 feet.
B— 1,000 feet.
C— 500 feet.

3469. While in controlled airspace in VFR conditions, what in-flight visibility is required when flying more than 1,200 feet AGL and at or above 10,000 feet MSL?

A— 1 SM.
B— 3 SM.
C— 5 SM.

3470. While in uncontrolled airspace in VFR conditions, what in-flight visibility is required when flying more than 1,200 feet AGL and less than 10,000 feet MSL?

A— 5 SM.
B— 3 SM.
C— 1 SM.

3471. When operating an airplane within a control zone under special VFR, the flight visibility is required to be at least

A— 3 SM.
B— 2 SM.
C— 1 SM.

3472. No person may operate an airplane within a control zone between sunset and sunrise under special VFR unless the

A— flight visibility is at least 3 miles.
B— airplane is equipped for instrument flight.
C— flight can be conducted 500 feet below the clouds.

3474. Which is required to operate a helicopter within a control zone between sunset and sunrise under special VFR?

A— The pilot must possess an instrument rating and have satisfied currency requirements.
B— The helicopter must be equipped for instrument flight and the visibility must be at least 1 mile.
C— The helicopter must be operated at a speed that allows the pilot the opportunity to see and avoid other traffic or obstructions.

3475. May a helicopter operate in a control zone at night under special VFR?

A— Yes; regulations permit this.
B— No; this is permitted for airplanes only.
C— Yes; but the pilot must be instrument rated and the helicopter must be instrument equipped.

3476. When operating under VFR at more than 3,000 feet AGL, cruising altitudes to be maintained are based upon the

A— true course being flown.
B— magnetic course being flown.
C— magnetic heading being flown.

3477. Which courses and altitudes are appropriate for VFR aircraft operating more than 3,000 feet AGL, but below 18,000 feet MSL?

A— True course 0° to 179° inclusive, odd thousands plus 500 feet.
B— Magnetic course 0° to 179° inclusive, even thousands plus 500 feet.
C— Magnetic course 180° to 359° inclusive, even thousands plus 500 feet.

aircraft during VFR night flights?

A— Anticollision light system.
B— Appropriate radio navigational equipment.
C— Artificial horizon and rate-of-turn indicator.

3480. When conducting VFR operations at night for hire, aircraft must be equipped with at least

A— a sensitive altimeter.
B— one electric landing light.
C— a flashing strobe on the vertical stabilizer.

3481. When an aircraft is being flown over water, under what circumstance must approved flotation gear be readily available to each occupant?

A— At night and over water beyond gliding distance from shore.
B— Anytime the aircraft is beyond power-off gliding distance from shore.
C— When operating for hire beyond power-off gliding distance from shore.

3482. What is the maximum distance from an airport that an aircraft engaged in training operations may be operated without an emergency locator transmitter?

A— 50 NM.
B— 25 NM.
C— 10 NM.

3483. How long may an aircraft be operated after the emergency locator transmitter has been initially removed for maintenance?

A— 90 days.
B— 30 days.
C— 7 days.

A— is in an area marked by obstruction lights.
B— is equipped with an electric landing or taxi light.
C— has lighted aviation red or white anticollision lights.

3486. Position lights are required to be displayed on all aircraft in flight from

A— sunset to sunrise.
B— 1 hour before sunset to 1 hour after sunrise.
C— 30 minutes before sunrise to 30 minutes after sunset.

3487. Unless each occupant is provided with supplemental oxygen, no person may operate a civil aircraft of U.S. registry above a cabin pressure altitude of

A— 12,500 feet MSL.
B— 14,000 feet MSL.
C— 15,000 feet MSL.

3488. Which cabin pressure altitude allows a pilot to operate an aircraft up to 30 minutes without supplemental oxygen?

A— 15,000 feet MSL.
B— 14,500 feet MSL.
C— 12,500 feet MSL.

3489. The primary purpose of a minimum equipment list (MEL) is to

A— provide a list of equipment that must be operational at all times on the aircraft.
B— list the equipment that can be inoperative and still not affect the airworthiness of an aircraft.
C— list the minimum equipment that must be installed in all aircraft as required by airworthiness directives.

A— 1 hour.
B— 8 hours.
C— 24 hours.

3492. A coded transponder with altitude reporting capability is required for all controlled airspace

A— below 14,500 feet MSL.
B— above 12,500 feet MSL (excluding airspace at or below 2,500 feet AGL).
C— at and above 10,000 feet MSL (excluding airspace at or below 2,500 feet AGL).

3493. An altitude reporting coded transponder is required for all airspace

A— from the surface to 10,000 feet MSL within a 10 NM radius of any airport traffic area.
B— at and above 10,000 feet MSL and below the floor of the positive control area (excluding airspace at or below 2,500 feet AGL).
C— within 25 NM of a terminal control area primary airport from the surface upward to 10,000 feet MSL (excluding airspace below 1,200 feet AGL).

3494. What are the requirements, if any, to overfly an airport radar service area (ARSA)?

A— None, provided the flight remains above the ARSA ceiling.
B— Two-way radio and transponder with automatic altitude reporting capability are required above the ARSA ceiling and upward to 10,000 feet MSL.
C— Two-way radio communications must be established with ATC and transponder must be operating at all times.

A— 1,500 feet AGL.
B— 2,000 feet MSL.
C— 3,000 feet AGL.

3497. What is the minimum flight visibility required for acrobatic flight?

A— 5 miles.
B— 3 miles.
C— 1 mile.

3498. When must each occupant of an aircraft wear an approved parachute?

A— When flying over water beyond gliding distance to the shore.
B— When practicing spins or other flight maneuvers for any certificate or rating.
C— When an intentional maneuver that exceeds 30° noseup or nosedown relative to the horizon is made.

3499. Which of the following is required to operate an aircraft towing an advertising banner?

A— Approval from ATC to operate in a control area.
B— A record of training in towing for the pilot in command.
C— A certificate of waiver issued by the Administrator.

3500. Who is responsible for ensuring that an aircraft airworthiness directive is complied with?

A— The owner or operator of the aircraft.
B— The airworthiness inspector from the local FAA district office.
C— Maintenance personnel responsible for the 100-hour inspection or annual inspection.

substantially affected by an alteration or repair, the aircraft documents must show that it was test flown and approved for return to service by an appropriately rated pilot prior to being flown

A— with passengers aboard.
B— for compensation or hire.
C— away from the vicinity of the airport.

3503. An aircraft's last annual inspection was performed on July 12, this year. The next annual inspection will be due no later than

A— July 13, next year.
B— July 31, next year.
C— 12 calendar months after the date shown on the Airworthiness Certificate.

3504. Which operation is prohibited if the aircraft being used has not had a 100-hour inspection or annual inspection within the preceding 100 hours of time in service?

A— Giving flight instruction for hire.
B— Conducting any commercial operation.
C— Carrying passengers, either for hire or not for hire.

3505. An aircraft operated for hire with passengers aboard has a 100-hour inspection performed after 90 hours in service. The next 100-hour inspection would be due after

A— 90 hours' time in service.
B— 100 hours' time in service.
C— 110 hours' time in service.

it has been tested and inspected?

A— 12 calendar months.
B— 24 calendar months.
C— 36 calendar months.

3508. Unless equipped with a life preserver or an approved flotation device for each occupant, no person may take off in a large or turbine-powered multiengine airplane for a flight over water of more than

A— 50 NM from the nearest shoreline.
B— 100 NM from the nearest shoreline.
C— 30 minutes' flying time from the nearest shoreline.

3509. In addition to the items required by FAR Part 91, Subpart A, the pilot in command shall ensure that a large airplane has on board, and within access,

A— a cockpit checklist.
B— a complete set of IFR navigation charts.
C— a flashlight having at least three size "D" cells.

3510. The NTSB defines a serious injury as any injury which

A— causes severe tendon damage.
B— results in a simple fracture of the nose.
C— involves first degree burns over 5 percent of the body.

3511. Notification to the NTSB is required when there has been substantial damage which

A— adversely affects aircraft performance.
B— causes small punctured holes in the skin or fabric.
C— results in more than $25,000 for repairs to the aircraft.

B— within 7 days.
C— within 10 days.

3514. The operator of an aircraft that has been involved in an accident is required to file a report within how many days?

A— 3.
B— 7.
C— 10.

3515. The operator of an aircraft that has been involved in an incident is required to submit a report to the nearest field office of the NTSB

A— within 7 days.
B— within 10 days.
C— only if requested to do so.

3516. The use of a slot in the leading edge of the wing enables the airplane to land at a slower speed because it

A— changes the camber of the wing.
B— delays the stall to a higher angle of attack.
C— decelerates the upper surface boundary layer air.

3517. The tendency of an aircraft to develop forces which restore it to its original condition, when disturbed from a condition of steady flight, is known as

A— stability.
B— controllability.
C— maneuverability.

overcomes the increased drag.
B— The increased impact of the relative wind on the wing's lower surface creates a greater amount of air being deflected downward.
C— The increased speed of the air passing over the airfoil's upper surface increases the pressure, thus creating a greater pressure differential between the upper and lower surface.

3520. The three axes of an aircraft intersect at the

A— center of gravity.
B— center of pressure.
C— midpoint of the mean chord.

3521. An airplane would have a tendency to nose up and have an inherent tendency to enter a stalled condition when the center of pressure is

A— below the center of gravity.
B— aft of the center of gravity.
C— forward of the center of gravity.

3522. When considering the forces acting upon an airplane in straight-and-level flight at constant airspeed, which statement is correct?

A— Weight always acts vertically toward the center of the Earth.
B— Thrust always acts forward parallel to the relative wind and is greater than drag.
C— Lift always acts perpendicular to the longitudinal axis of the wing and is greater than weight.

3524. When rolling out of a steep-banked turn, what causes the lowered aileron to create more drag than when rolling into the turn?

A— The wing's angle of attack is greater as the rollout is started.
B— The wing being raised is traveling faster through the air than the wing being lowered.
C— The wing being lowered is traveling faster through the air and producing more lift than the wing being raised.

3525. How can a pilot increase the rate of turn and decrease the radius at the same time?

A— Shallow the bank and increase airspeed.
B— Steepen the bank and decrease airspeed.
C— Steepen the bank and increase airspeed.

3526. Which statement is true concerning the aerodynamic conditions which occur during a spin entry?

A— After a full stall, both wings remain in a stalled condition throughout the rotation.
B— After a partial stall, the wing that drops remains in a stalled condition while the rising wing regains and continues to produce lift, causing the rotation.
C— After a full stall, the wing that drops continues in a stalled condition while the rising wing regains and continues to produce some lift, causing the rotation.

3527. The point on an airfoil through which lift acts is the

A— center of gravity.
B— center of pressure.
C— midpoint of the chord.

B— the angle of attack.
C— the angle of incidence.

3530. The angle between the chord line of an airfoil and the relative wind is known as the angle of

A— lift.
B— attack.
C— incidence.

3531. A line drawn from the leading edge to the trailing edge of an airfoil and equidistant at all points from the upper and lower contours is called the

A— chord line.
B— camber line.
C— mean camber line.

3532. The force which imparts a change in the velocity of a mass is called

A— work.
B— power.
C— thrust.

3533. During a steady climb, the rate of climb depends on

A— excess power.
B— excess thrust.
C— thrust available.

3534. During a steady climb, the angle of climb depends on

A— excess thrust.
B— power available
C— thrust required.

resulting from relatively

A— positive air pressure below and above the wing's surface.
B— negative air pressure below the wing's surface and positive air pressure above the wing's surface.
C— positive air pressure below the wing's surface and negative air pressure above the wing's surface.

3537. During flight with zero angle of attack, the pressure along the upper surface of the wing would be

A— equal to atmospheric pressure.
B— less than atmospheric pressure.
C— greater than atmospheric pressure.

3538. That portion of the aircraft's total drag created by the production of lift is called

A— induced drag, and is not affected by changes in airspeed.
B— induced drag, and is greatly affected by changes in airspeed.
C— parasite drag, and is greatly affected by changes in airspeed.

3539. As airspeed increases in level flight, total drag of the aircraft becomes greater than the total drag produced at the maximum lift/drag speed because of the

A— increase in induced drag.
B— decrease in induced drag.
C— increase in parasite drag.

A— form drag.
B— profile drag.
C— parasite drag.

3542. Which relationship is correct when comparing drag and airspeed?

A— Induced drag increases as the square of the airspeed.
B— Induced drag varies inversely as the square of the airspeed.
C— Profile drag varies inversely as the square of the airspeed.

3543. Which statement describes the relationship of the forces acting on an aircraft in a constant-power and constant-airspeed descent?

A— Thrust is equal to drag; lift is equal to weight.
B— Thrust is equal to drag; weight is greater than lift.
C— Thrust is greater than drag; weight is greater than lift.

3544. Which statement is true regarding the forces acting on an aircraft in a steady-state climb?

A— The sum of all forward forces is greater than the sum of all rearward forces.
B— The sum of all upward forces is greater than the sum of all downward forces.
C— The sum of all upward forces is equal to the sum of all downward forces.

3545. As the angle of bank is increased, the vertical component of lift

A— increases and the sink rate increases.
B— decreases and the sink rate increases.
C— increases and the sink rate decreases.

C— Change the direction of thrust.

3548. The angle of attack of a wing directly controls the

A— angle of incidence of the wing.
B— amount of airflow above and below the wing.
C— distribution of positive and negative pressure acting on the wing.

3549. The angle of attack at which an aircraft stalls

A— increases with an increase in engine power.
B— remains constant regardless of gross weight.
C— varies with gross weight and density altitude.

3550. Which statement is true relating to the factors which produce stalls?

A— The critical angle of attack is a function of the degree of bank.
B— The stalling angle of attack depends upon the speed of the airflow over the wings.
C— The stalling angle of attack is independent of the speed of airflow over the wings.

3551. The critical angle of attack at which a given airplane stalls is dependent on the

A— gross weight.
B— design of the wing.
C— attitude and airspeed.

3552. If the same angle of attack is maintained in ground effect as when out of ground effect, lift will

A— increase, and induced drag will decrease.
B— decrease, and parasite drag will increase.
C— decrease, and parasite drag will decrease.

required to sustain level flight at higher altitudes. This is the result of

A— interference of the ground surface with the airflow patterns about the airplane in flight.
B— a cushioning effect of the air as it is trapped between the ground and the descending airplane.
C— ground interference with the static pressure system which produces false indications on the airspeed indicator.

3555. An airplane leaving ground effect will

A— experience a decrease in thrust required.
B— experience a decrease in stability and a noseup change in moments.
C— require a lower angle of attack to attain the same lift coefficient.

3556. An airplane is usually affected by ground effect at what height above the surface?

A— Three to four times the airplane's wingspan.
B— Twice the airplane's wingspan above the surface.
C— Less than half the airplane's wingspan above the surface.

3557. If severe turbulence is encountered, the airplane's airspeed should be reduced to

A— maneuvering speed.
B— normal structural cruising speed.
C— the minimum steady flight speed in the landing configuration.

3558. If an airplane's gross weight is 3,250 pounds, what is the load acting on this airplane during a level 60° banked turn?

A— 3,250 pounds.
B— 5,200 pounds.
C— 6,500 pounds.

A— stall.
B— break apart.
C— be subjected to structural damage.

3561. (Refer to figure 18.) What load factor would be created if positive 30 feet per second gusts were encountered at 130 MPH?

A— 3.8.
B— 3.0.
C— 2.0.

3562. (Refer to figure 18.) The horizontal dashed line from point B to point D represents the

A— positive limit load factor.
B— airspeed range for normal operations.
C— maximum structural cruise airspeed range.

3563. (Refer to figure 18.) The airspeed indicated by point B is

A— V_A.
B— V_{NE}.
C— V_{NO}.

3564. (Refer to figure 18.) The airspeed indicated by point D is

A— V_A.
B— V_{NE}.
C— V_{NO}.

3565. (Refer to figure 18.) The airspeed indicated by point C is

A— V_A.
B— V_{NE}.
C— V_{NO}.

A— 91 knots.
B— 132 knots.
C— 140 knots.

3568. (Refer to figure 19.) If, during a steady turn with a 50° bank, a load factor of 1.5 were imposed on an airplane which has an unaccelerated stall speed of 60 knots, at what speed would the airplane first stall?

A— 68 knots.
B— 75 knots.
C— 82 knots.

3569. (Refer to figure 19.) A 70 percent increase in stalling speed would imply a bank angle of

A— 67°.
B— 70°.
C— 83°.

3570. (Refer to figure 19.) What is the stall speed of an airplane under a load factor of 2 if the unaccelerated stall speed is 100 knots?

A— 115 knots.
B— 129 knots.
C— 140 knots.

3571. (Refer to figure 20.) Which statement is true regarding airplane flight at L/D_{max}?

A— Any angle of attack other than that for L/D_{max} increases parasite drag.
B— Any angle of attack other than that for L/D_{max} increases the lift/drag ratio.
C— Any angle of attack other than that for L/D_{max} increases total drag for a given airplane's lift.

A— 6°.
B— 12.3°.
C— 20°.

3574. Which action will result in a stall?

A— Flying at too low an airspeed.
B— Raising the airplane's nose too high.
C— Exceeding the critical angle of attack.

3575. (Refer to figure 21.) At the airspeed represented by point A, in steady flight, the aircraft will

A— have its maximum lift/drag ratio.
B— have its minimum lift/drag ratio.
C— be developing its maximum coefficient of lift.

3576. (Refer to figure 21.) At an airspeed represented by point B, in steady flight, the pilot can expect to obtain the aircraft's

A— maximum coefficient of lift.
B— minimum coefficient of lift.
C— maximum glide range in still air.

3577. Which aircraft characteristics contribute to spiral instability?

A— Weak static directional stability and weak dihedral effect.
B— Strong static directional stability and weak dihedral effect.
C— Weak static directional stability and strong dihedral effect.

3578. The most desirable type of stability for an aircraft to possess is

A— neutral static stability.
B— positive static stability.
C— positive dynamic stability.

A— positive static stability.
B— neutral dynamic stability.
C— negative dynamic stability.

3581. If the aircraft's nose initially tends to move farther from its original position after the elevator control is pressed forward and released, the aircraft displays

A— negative static stability.
B— positive static stability.
C— positive dynamic stability.

3582. The quality of an airplane that permits it to be operated easily and to withstand the stresses imposed on it is

A— stability.
B— maneuverability.
C— controllability.

3583. The capability of an airplane to respond to the pilot's inputs, especially with regard to flightpath and attitude, is

A— response.
B— controllability.
C— maneuverability.

3584. If the aircraft's nose remains in the new position after the elevator control is pressed forward and released, the aircraft displays

A— neutral static stability.
B— negative static stability.
C— positive static stability.

A— undamped oscillations.
B— divergent oscillations.
C— convergent oscillations.

3587. If an increase in power tends to make the nose of the aircraft rise, this is the result of the

A— line of thrust being below the center of gravity.
B— center of lift being ahead of the center of gravity.
C— center of lift and center of gravity being collocated.

3588. Which subsonic planform provides the best lift coefficient?

A— Tapered wing.
B— Elliptical wing.
C— Rectangular wing.

3589. On which wing planform does the stall begin at the wingtip and progress inward toward the wing root?

A— Sweepback wing.
B— Elliptical wing.
C— Moderate taper wing.

3590. A rectangular wing, as compared to other wing planforms, has a tendency to stall first at the

A— wingtip providing adequate stall warning.
B— wing root providing adequate stall warning.
C— wingtip providing inadequate stall warning.

3591. The purpose of aircraft wing dihedral angle is to

A— increase lateral stability.
B— increase longitudinal stability.
C— increase lift coefficient of the wing.
C— poor control qualities at low airspeeds.

3594. At a constant velocity in airflow, a high aspect ratio wing will have (in comparison with a low aspect ratio wing)

A— increased drag, especially at a low angle of attack.
B— decreased drag, especially at a high angle of attack.
C— increased drag, especially at a high angle of attack.

3595. (Refer to figure 22.) Which aircraft has the highest aspect ratio?

A— 2.
B— 3.
C— 4.

3596. (Refer to figure 22.) Which aircraft has the lowest aspect ratio?

A— 2.
B— 3.
C— 4.

3597. (Refer to figure 22.) Consider only aspect ratio (other factors remain constant). Which aircraft will generate greatest lift?

A— 1.
B— 2.
C— 3.

3598. (Refer to figure 22.) Consider only aspect ratio (other factors remain constant). Which aircraft will generate greatest drag?

A— 1.
B— 3.
C— 4.

3600. (Refer to figure 23.) While rolling into a right turn, if the inclinometer appears as illustrated in C, the HCL and CF vectors would be acting on the aircraft as illustrated in

A— 3, and less right rudder pressure is needed to center the ball.
B— 5, and less right rudder pressure is needed to center the ball.
C— 5, and more right rudder pressure is needed to center the ball.

3601. (Refer to figure 23.) While rolling out of a left turn, if the inclinometer appears as illustrated in A, the HCL and CF vectors would be acting on the aircraft as illustrated in

A— 4, and more right rudder pressure is needed to center the ball.
B— 4, and more left rudder pressure is needed to center the ball.
C— 2, and more right rudder pressure is needed to center the ball.

3602. As a result of gyroscopic precession, it can be said that any

A— pitching around the lateral axis results in a rolling moment.
B— yawing around the vertical axis results in a pitching moment.
C— pitching around the longitudinal axis results in a yawing moment.

3603. Propeller slip is the difference between the

A— geometric pitch and blade angle of the propeller.
B— geometric pitch and the effective pitch of the propeller.
C— plane of rotation of the propeller and forward velocity of the airplane.
C— angle of attack and line of thrust.

3606. A propeller rotating clockwise, as seen from the rear, creates a spiraling slipstream that tends to rotate the aircraft to the

A— right around the vertical axis, and to the left around the longitudinal axis.
B— left around the vertical axis, and to the right around the longitudinal axis.
C— left around the vertical axis, and to the left around the longitudinal axis.

3607. The reason for variations in geometric pitch (twisting) along a propeller blade is that it

A— prevents the portion of the blade near the hub to stall during cruising flight.
B— permits a relatively constant angle of attack along its length when in cruising flight.
C— permits a relatively constant angle of incidence along its length when in cruising flight.

3608. With regard to gyroscopic precession, when a force is applied at a point on the rim of a spinning disc, the resultant force acts in which direction and at what point?

A— In the same direction as the applied force, 90° ahead in the plane of rotation.
B— In the opposite direction of the applied force, 90° ahead in the plane of rotation.
C— In the opposite direction of the applied force, at the point of the applied force.

which rotate clockwise, the critical engine is the

A— left engine, because the right engine center of thrust is closer to the centerline of the fuselage.
B— right engine, because the left engine center of thrust is closer to the centerline of the fuselage.
C— left engine, because the right engine center of thrust is farther away from the centerline of the fuselage.

3611. On a multiengine airplane, where the propellers rotate in the same direction, why is the loss of power on one engine more critical than the loss of power on the other engine?

A— The corkscrew pattern of airflow from one propeller is less effective against the airflow from the critical engine.
B— The torque reaction from operation of the critical engine is more severe around the vertical axis as well as the longitudinal axis.
C— The asymmetric propeller thrust or P-factor results in the center of thrust from one engine being farther from the airplane centerline than the center of thrust from the other engine.

3612. The rotor blade pitch angle is the acute angle between the blade chord line and the

A— angle of attack.
B— rotor plane of rotation.
C— direction of the relative wind.

3613. Rotor blade flapping action is

A— an aerodynamic reaction to high-speed flight only.
B— a desirable design feature which compensates for dissymmetry of lift.
C— an undesirable reaction to changes in airspeed and blade angle of attack.

is rigged away from the vertical position by approximately 1°. This slight vertical offset is primarily for the purpose of counteracting

A— yaw.
B— drift.
C— torque.

3616. Coning is caused by the combined forces of

A— gravity and thrust.
B— lift and centrifugal force.
C— weight and centrifugal force.

3617. As each blade flaps up and down, it produces a shift of the center of its mass. When the blade flaps up, the CG moves closer to its axis of rotation, giving that blade a tendency to

A— accelerate its rotational velocity; this tendency is known as Coriolis effect.
B— stabilize its rotational velocity, thus compensating for dissymmetry of lift.
C— decelerate its rotational velocity; this tendency is known as translating tendency.

3618. The forward speed of a rotorcraft is restricted primarily by

A— dissymmetry of lift.
B— transverse flow effect.
C— high-frequency vibrations.

3620. During forward cruising flight at constant airspeed and altitude, the individual rotor blades, when compared to each other, are operating at

A— unequal airspeed, equal angles of attack, and unequal lift moment.
B— unequal airspeed, unequal angles of attack, and equal lift moment.
C— constant airspeed, unequal angles of attack, and unequal lift moment.

3621. When a rotorcraft transitions from straight-and-level flight into a 30° bank while maintaining a constant altitude, the total lift force must

A— increase, and the load factor will decrease.
B— increase, and the load factor will increase.
C— remain constant, and the load factor will increase.

3622. The rotor RPM may momentarily increase during the flare portion of a flare-type autorotation. This increase in rotor RPM is due to

A— an increased downwash velocity.
B— a decrease in rotor drag brought about by a lack of forward motion.
C— the additional lift derived from the increased angle of attack of the main rotor disc.

3623. Which statement is generally true regarding wing camber of a glider's airfoil?

A— There is no camber on either the upper or lower surface of the wing.
B— The camber is the same on both the upper and lower surface of the wing.
C— The camber is greater on the upper wing surface than it is on the lower surface of the wing.

B— Increase of Dutch roll tendency.
C— Increase of longitudinal static stability.

3626. Excessively high engine temperatures, either in the air or on the ground, will

A— increase fuel consumption and may increase power due to the increased heat.
B— result in damage to heat-conducting hoses and warping of the cylinder cooling fans.
C— cause loss of power, excessive oil consumption, and possible permanent internal engine damage.

3627. If the engine oil temperature and cylinder head temperature gauges have exceeded their normal operating range, you may have been

A— operating with the mixture set too rich.
B— using fuel that has a higher-than-specified fuel rating.
C— operating with too much power and with the mixture set too lean.

3628. To properly purge water from the fuel system of an airplane equipped with fuel tank sumps and a fuel strainer quick drain, it is necessary to drain fuel from the

A— fuel strainer drain only.
B— lowest point in the fuel system only.
C— fuel strainer drain and the fuel tank sumps.

3629. If the grade of fuel used in an aircraft engine is lower than specified for the engine, it will most likely cause

A— detonation.
B— lower cylinder head temperatures.
C— an increase in power which could overstress internal engine components.

3631. Which statement is true regarding fouling of the spark plugs of an aircraft engine?

A— Spark plug fouling results from operating with an excessively rich mixture.
B— Carbon fouling of the spark plugs is caused primarily by operating an engine at excessively high cylinder head temperatures.
C— Excessive heat in the combustion chamber of a cylinder causes oil to form on the center electrode of a spark plug and this fouls the plug.

3632. When refueling aircraft, which precaution would be adequate for eliminating the potential hazard of static electricity?

A— Ensure that battery and ignition switches are off.
B— Connect a ground wire from the fuel truck to ground.
C— Connect a ground wire between the aircraft, fuel truck, fuel nozzle, and ground.

3633. As flight altitude increases, what will occur if no leaning is made with the mixture control?

A— The volume of air entering the carburetor decreases and the amount of fuel decreases.
B— The density of air entering the carburetor decreases and the amount of fuel increases.
C— The density of air entering the carburetor decreases and the amount of fuel remains constant.

3634. When the pilot leans the mixture control, what is being accomplished?

A— The volume of air entering the carburetor is being reduced.
B— The volume of air entering the carburetor is being increased.
C— The amount of fuel entering the combustion chamber is being reduced.

A— a fuel-flow gauge.
B— an exhaust gas temperature indicator.
C— the recommended manifold and RPM setting for a particular altitude.

3637. Fuel/air ratio is the ratio between the

A— volume of fuel and volume of air entering the cylinder.
B— weight of fuel and weight of air entering the cylinder.
C— weight of fuel and weight of air entering the carburetor.

3638. Detonation in an aircraft engine is most likely to occur whenever the

A— fuel/air ratio is such that the mixture burns extremely slow.
B— engine is operated under conditions which cause the fuel mixture to burn instantaneously.
C— fuel being used is of a higher grade than recommended by the engine manufacturer.

3639. Detonation occurs at high power settings when the

A— fuel mixture explodes instead of burning progressively and evenly.
B— fuel mixture is ignited too early by red-hot carbon deposits in the cylinder.
C— intake valve opens before the previous charge of fuel has finished burning in the cylinder.

carburetors is based on the

A— measurement of the fuel flow into the induction system.
B— difference in air pressure at the venturi throat and the throttle valve.
C— increase in air velocity in the throat of a venturi causing a decrease in air pressure.

3642. One advantage of fuel injection systems over carburetor systems is

A— easier hot-engine starting.
B— better fuel distribution to the cylinders.
C— less difficulty with hot weather vapor locks during ground operations.

3643. The presence of carburetor ice in an airplane equipped with a fixed-pitch propeller can be verified by applying carburetor heat and noting

A— a decrease in RPM and then a constant RPM indication.
B— a decrease in RPM and then a gradual increase in RPM.
C— an increase in RPM and then a gradual decrease in RPM.

3644. The first indication of carburetor icing in airplanes equipped with constant-speed propellers would most likely be a

A— decrease in RPM.
B— decrease in manifold pressure.
C— rough running engine followed by loss of RPM.

3645. The first indication of carburetor ice in an aircraft with a fixed-pitch propeller is

A— a decrease in RPM.
B— a decrease in manifold pressure.
C— an increase in manifold pressure.

A— Carburetor icing will form in a carburetor whenever the ambient temperature is below freezing 32 °F (0 °C).
B— Carburetor icing would most likely form when the air temperature is between 20 °F and 70 °F with visible moisture or high humidity.
C— The first indication of carburetor icing in an airplane equipped with a fixed-pitch propeller is an increase in RPM, followed by a decrease in RPM.

3648. The practice of running a fuel tank dry before switching tanks is considered unwise because

A— any foreign matter in the tank will be pumped into the fuel system.
B— the engine-driven fuel pump is lubricated by fuel and operating on a dry tank may cause pump failure.
C— the engine-driven fuel pump or electric fuel boost pump draw air into the fuel system and cause vapor lock.

3649. Which statement is true regarding propeller efficiency?

A— Propeller efficiency is the ratio of thrust horsepower to brake horsepower.
B— Propeller efficiency is the actual distance a propeller advances in one revolution.
C— Propeller efficiency is the difference between the geometric pitch of the propeller and its effective pitch.

3651. During which stroke of a reciprocating engine is the gaseous mixture expanding within the cylinder?

A— Power stroke.
B— Intake stroke.
C— Compression stroke.

3652. To absorb maximum engine power and to develop maximum thrust, a constant-speed propeller should be adjusted to a blade angle which will produce a

A— large angle of attack and low RPM.
B— large angle of attack and high RPM.
C— small angle of attack and high RPM.

3653. Concerning the advantages of an aircraft generator or alternator, select the true statement.

A— A generator always provides more electrical current than an alternator.
B— An alternator provides more electrical power at lower engine RPM than a generator.
C— A generator charges the battery during low engine RPM; therefore, the battery has less chance to become fully discharged, as often occurs with an alternator.

3654. If the ground wire between the magneto and the ignition switch becomes disconnected, the most noticeable result will be that the engine

A— will run very rough.
B— cannot be started with the switch in the ON position.
C— cannot be shut down by turning the switch to the OFF position.

will normally indicate

A— a turn momentarily, with changes in airspeed on any heading.
B— a turn toward the south while accelerating on a west heading.
C— correctly when on a north or south heading while either accelerating or decelerating.

3657. Deviation error of the magnetic compass is caused by

A— northerly turning error.
B— certain metals and electrical systems within the aircraft.
C— the difference in location of true north and magnetic north.

3658. In the Northern Hemisphere, which would be correct about starting the rollout from a turn using a magnetic compass?

A— Start the rollout after the compass indication passes south by a number of degrees approximately equal to the latitude minus the normal rollout lead.
B— Start the rollout before the compass indication reaches south by a number of degrees approximately equal to the latitude over which the turn is made plus the pilot's normal lead.
C— Start the rollout after the compass indication passes south by a number of degrees approximately equal to the magnetic variation of the area over which the turn is made plus the pilot's normal lead.

3660. Which statement is true about magnetic deviation of a compass?

A— Deviation is the same for all aircraft in the same locality.
B— Deviation varies for different headings of the same aircraft.
C— Deviation is different in a given aircraft in different localities.

3661. Which instrument would be affected by excessively low pressure in the airplane's vacuum system?

A— Heading indicator.
B— Airspeed indicator.
C— Pressure altimeter.

3662. Pitot-static system errors are generally the greatest in which range of airspeed?

A— Low airspeed.
B— High airspeed.
C— Maneuvering speed.

3663. During power-off stalls with flaps full down, the stall occurs and the pointer on the airspeed indicator shows a speed less than the minimum limit of the white arc on the indicator. This is most probably due to

A— a low density altitude.
B— a malfunction in the pitot-static system.
C— installation error in the pitot-static system.

3664. If a pitot tube is clogged, which instrument would be affected?

A— Altimeter.
B— Airspeed indicator.
C— Vertical speed indicator.

A— Warmer-than-standard temperatures will place the aircraft lower than the altimeter indicates.
B— Colder-than-standard temperatures will place the aircraft lower than the altimeter indicates.
C— Colder-than-standard temperatures will place the aircraft higher than the altimeter indicates.

3667. A possible result of using the emergency alternate source of static pressure inside the cabin of an unpressurized airplane is the

A— airspeed indicator may indicate less than normal.
B— altimeter may indicate an altitude lower than the actual altitude being flown.
C— altimeter may indicate an altitude higher than the actual altitude being flown.

3668. Prior to starting the engine, the manifold pressure gauge usually indicates approximately 29" Hg. This is because the

A— pointer on the gauge is stuck at the full-power indication.
B— throttle is closed, trapping high air pressure in the manifold.
C— pressure within the manifold is the same as atmospheric pressure.

3669. What energy source is used to drive the turbines of a turbocharged airplane?

A— Ignition system.
B— Engine compressor.
C— Engine exhaust gases.

approximately constant until the

A— engine's critical altitude is reached.
B— airplane's service ceiling is reached.
C— waste gate is fully open and the turbine is operating at minimum speed.

3672. In addition to an added safety factor, dual ignition systems also provide

A— better combustion.
B— increased spark plug life.
C— shorter engine warmup periods.

3673. During the transition from prerotation to flight, all rotor blades change pitch

A— simultaneously to the same angle of incidence.
B— simultaneously but to different angles of incidence.
C— to the same degree at the same point in the cycle of rotation.

3674. Which statement is true concerning rotor systems?

A— The main rotor blades of a semirigid rotor system can flap and feather as a unit.
B— The horizontal flapping hinge on a fully articulated rotor system enables the main rotor blades to hunt.
C— Dampers are normally incorporated in a fully articulated rotor system to prevent excessive motion about the spanwise axis of each rotor blade.

3675. The main rotor blades of a fully-articulated rotor system can

A— flap and feather collectively.
B— flap, drag, and feather independently.
C— flap and drag independently, but can feather collectively only.

A— It allows the engine to be started without driving the main rotor system.
B— It provides disengagement of the engine from the rotor system for autorotation.
C— It transmits engine power to the main rotor, tail rotor, generator/alternator, and other accessories.

3678. A high-frequency vibration that suddenly occurs during flight could be an indication of a defective

A— transmission.
B— ignition system.
C— freewheeling unit.

3679. A high-frequency vibration in flight would most likely indicate potential trouble in the

A— main rotor system.
B— engine in most helicopters.
C— tail rotor due to improper rigging.

3680. Helicopter low-frequency vibrations are always associated with the

A— engine.
B— main rotor.
C— transmission.

3681. An electrical system failure (battery and alternator) occurs during flight. In this situation, you would

A— experience avionics equipment failure.
B— probably experience failure of the engine ignition system, fuel gauges, aircraft lighting system, and avionics equipment.
C— probably experience engine failure due to the loss of the engine-driven fuel pump and also experience failure of the radio equipment, lights, and all instruments that require ac current.

A— Ensure that only medical oxygen has been used to replenish oxygen containers.
B— Prohibit smoking while in an aircraft equipped with a portable oxygen system.
C— Ensure that industrial oxygen has not been used to replenish the system.

3684. Which statement is true regarding preheating of an aircraft during cold-weather operations?

A— The cockpit, as well as the engine, should be preheated.
B— The cockpit area should not be preheated with portable heaters.
C— Hot air should be blown directly at the engine through the air intakes.

3685. Crankcase breather lines of an aircraft engine should receive special attention during preflight in cold weather because they are susceptible to being clogged by

A— ice in the breather lines.
B— congealed oil from the crankcase.
C— moisture from the outside air which has frozen.

3686. If both the ram-air input and drain hole of the pitot system are blocked, what airspeed indication can be expected?

A— Decrease of indicated airspeed during a climb.
B— Zero indicated airspeed until blockage is removed.
C— No variation of indicated airspeed in level flight even if large power changes are made.

A— The instrument responds only to up and down air currents.
B— The instrument indicates the average rate of climb in a thermal.
C— The instrument reacts to climbs and descends like a conventional rate-of-climb indicator.

3689. What is the purpose of the rebreather bag on an oxygen mask in a continuous-flow system?

A— Helps to conserve oxygen.
B— Allows excess oxygen to be expelled during use.
C— Controls amount of oxygen that each individual breathes through the mask.

3690. (Refer to figure 24.) Which is a fowler flap?

A— 2.
B— 3.
C— 4.

3691. (Refer to figure 24.) Which is a slotted flap?

A— 1.
B— 3.
C— 4.

3692. (Refer to figure 24.) Which is a split flap?

A— 2.
B— 3.
C— 4.

3693. Which type of flap creates the greatest change in pitching moment?

A— Plain.
B— Split.
C— Fowler.

B— Fowler.
C— Slotted.

3696. What airspeed indicator marking identifies the maximum structural cruising speed of the airplane?

A— The red radial line.
B— The upper limit of the green arc.
C— The upper limit of the yellow arc.

3697. What does the lower limit of the white arc on an airspeed indicator represent?

A— Minimum controllable airspeed with flaps extended.
B— Power-off stall speed in a landing configuration.
C— Power-off stall speed in a specified configuration.

3698. What does the lower limit of the green arc on an airspeed indicator represent?

A— Power-off stall speed in a landing configuration.
B— Power-off stall speed in a specified configuration.
C— Minimum controllable airspeed with gear and flaps retracted.

3699. Which airspeed is identified by color coding on an airspeed indicator?

A— The design maneuvering speed.
B— The maximum structural cruising speed.
C— The maximum gear operation or extended speed.

Altimeter setting ..... 29.40" Hg

A— 6,000 feet.
B— 8,400 feet.
C— 9,050 feet.

3702. (Refer to figure 25.) Determine the density altitude.

Airport elevation ..... 3,795 ft
OAT ..... 75 °F
Altimeter setting ..... 29.70" Hg

A— 6,200 feet.
B— 5,900 feet.
C— 3,900 feet.

3703. (Refer to figure 25.) Determine the density altitude.

Airport elevation ..... 3,450 ft
OAT ..... 95 °F
Altimeter setting ..... 30.40" Hg

A— 7,200 feet.
B— 6,650 feet.
C— 5,950 feet.

3704. Density altitude increases with

A— an increase in temperature only.
B— increases in pressure, temperature, and moisture content of the air.
C— increases in temperature and moisture content of the air, and a decrease in pressure.

3705. What would increase the density altitude at a given airport?

A— An increase in air temperature.
B— A decrease in relative humidity.
C— An increase in atmospheric pressure.

remain the same, how would an increase in humidity affect takeoff performance?

A— Longer takeoff distance; the air is more dense.
B— Longer takeoff distance; the air is less dense.
C— Shorter takeoff distance; the air is more dense.

3708. As altitude increases, the indicated airspeed at which a given airplane stalls in a particular configuration will

A— remain the same as at low altitude.
B— decrease as the true airspeed increases.
C— increase because the air density becomes less.

3709. What effect does an uphill runway slope have upon takeoff performance?

A— Decreases takeoff speed.
B— Increases takeoff distance.
C— Decreases takeoff distance.

3710. (Refer to figure 26.) The gear is down and flaps are set at 15°. If the angle of bank is 20°, what would be the indicated stall speed?

A— 77 MPH.
B— 81 MPH.
C— 89 MPH.

3711. (Refer to figure 26.) If the bank angle is 60° with gear and flaps up, what would be the indicated stall speed?

A— 110 MPH.
B— 117 MPH.
C— 121 MPH.

Pressure altitude . . . . . 3,500 ft
Weight . . . . . 2,600 lb
Headwind . . . . . 25 MPH

A— 183 feet.
B— 223 feet.
C— 311 feet.

3714. (Refer to figure 27.) Determine the ground run required for takeoff.

Temperature . . . . . 77 °F
Pressure altitude . . . . . 2,000 ft
Weight . . . . . 2,200 lb
Headwind . . . . . 20 MPH

A— 106 feet.
B— 216 feet.
C— 310 feet.

3715. (Refer to figure 27.) Determine the takeoff distance required to clear a 50-foot obstacle.

Temperature . . . . . 72 °F
Pressure altitude . . . . . 3,200 ft
Weight . . . . . 2,300 lb
Headwind . . . . . 15 MPH

A— 606 feet.
B— 668 feet.
C— 754 feet.

3716. (Refer to figure 27.) Determine the takeoff distance required to clear a 50-foot obstacle.

Temperature . . . . . 62 °F
Pressure altitude . . . . . 6,000 ft
Weight . . . . . 2,700 lb
Headwind . . . . . 15 MPH

A— 995 feet.
B— 1,041 feet.
C— 1,145 feet.

A— 94 MPH.
B— 113 MPH.
C— 115 MPH.

3719. (Refer to figure 28.) To maintain the best rate of climb, the indicated speed should be

A— maintained at a constant value during the climb.
B— adjusted to maintain the specified rate of climb.
C— reduced approximately .8 MPH per 1,000 feet of altitude.

3720. In a propeller-driven airplane, maximum range occurs at

A— minimum drag required.
B— minimum power required.
C— maximum lift/drag ratio.

3721. (Refer to figure 29.) Determine the approximate total distance required to clear a 50-foot obstacle.

Temperature ..... 20 °C
Pressure altitude ..... 1,000 ft
Surface ..... sod
Weight ..... 5,300 lb
Wind ..... 15 kts headwind

A— 1,724 feet.
B— 1,816 feet.
C— 2,061 feet.

C— 2,462 feet.

3723. (Refer to figure 29.) Determine the approximate total distance required to clear a 50-foot obstacle.

Temperature ..... 35 °C
Pressure altitude ..... 3,000 ft
Surface ..... sod
Weight ..... 5,100 lb
Wind ..... 20 kts headwind

A— 1,969 feet.
B— 2,023 feet.
C— 2,289 feet.

3724. (Refer to figure 30.) What is the approximate glide distance?

Height above terrain ..... 5,500 ft
Tailwind ..... 10 kts

A— 11 miles.
B— 12 miles.
C— 13 miles.

3725. (Refer to figure 30.) What is the approximate glide distance?

Height above terrain ..... 10,500 ft
Tailwind ..... 20 kts

A— 24 miles.
B— 26 miles.
C— 28 miles.

Landing Rwy 30
Wind ..... 020° at 15 kts

A— 4 knots.
B— 15 knots.
C— 22 knots.

3728. (Refer to figure 31.) Determine the approximate crosswind component.

Landing Rwy 03
Wind ..... 060° at 35 kts

A— 12 knots.
B— 18 knots.
C— 22 knots.

3729. (Refer to figure 31.) Determine the approximate crosswind component.

Landing Rwy 22
Wind ..... 260° at 23 kts

A— 10 knots.
B— 15 knots.
C— 17 knots.

3730. (Refer to figure 31.) Using a maximum demonstrated crosswind component equal to 0.2 V_{SO}, what is a pilot able to determine?

V_{SO} ..... 70 kts
Landing Rwy 35
Wind ..... 300° at 20 kts

A— Headwind component is excessive.
B— Headwind component exceeds the crosswind component.
C— Maximum demonstrated crosswind component is exceeded.

3732. (Refer to figure 31.) Using a maximum demonstrated crosswind component equal to 0.2 V_{SO}, what is a pilot able to determine?

V_{SO} ..... 65 kts
Landing Rwy 17
Wind ..... 200° at 30 kts

A— Crosswind component is within safe limits.
B— Crosswind component exceeds the headwind component.
C— Maximum demonstrated crosswind component is exceeded.

3733. (Refer to figure 32.) What is the total landing distance over a 50-foot obstacle?

Temperature ..... 50 °F
Pressure altitude ..... 4,000 ft
Weight ..... 3,000 lb
Headwind ..... 22 kts

A— 1,250 feet.
B— 1,175 feet.
C— 1,050 feet.

3734. (Refer to figure 32.) Determine the approximate ground roll.

Temperature ..... 85 °F
Pressure altitude ..... 6,000 ft
Weight ..... 2,800 lb
Headwind ..... 14 kts

A— 742 feet.
B— 1,280 feet.
C— 1,480 feet.

3736. (Refer to figure 32.) Determine the approximate ground roll.

Temperature ..... 60 °F
Pressure altitude ..... 8,000 ft
Weight ..... 3,200 lb
Headwind ..... 18 kts

A— 795 feet.
B— 1,050 feet.
C— 1,500 feet.

3737. (Refer to figure 33.) How should the 1,000-pound weight be shifted to balance the plank on the fulcrum?

A— 15 inches to the right.
B— 5 inches to the right.
C— 5 inches to the left.

3738. (Refer to figure 33.) How should the 500-pound weight be shifted to balance the plank on the fulcrum?

A— 10 inches to the left.
B— 10 inches to the right.
C— 30 inches to the right.

3739. (Refer to figure 34.) How should the 250-pound weight be shifted to balance the plank on the fulcrum?

A— 2 inches to the left.
B— 2 inches to the right.
C— 2.5 inches to the left.

3740. (Refer to figure 34.) How should the 200-pound weight be shifted to balance the plank on the fulcrum?

A— 2.5 inches to the left.
B— 2 inches to the right.
C— 2 inches to the left.

A— 8.4 inches to the right.
B— 2 inches to the right.
C— 2 inches to the left.

3743. (Refer to figure 36.) If 50 pounds of weight is located at point X and 100 pounds at point Z, how much weight must be located at point Y to balance the plank?

A— 30 pounds.
B— 50 pounds.
C— 300 pounds.

3744. (Refer to figure 36.) If 50 pounds of weight is located at point X and 100 pounds at point Y, how much weight must be located at point Z to balance the plank?

A— 150 pounds.
B— 100 pounds.
C— 50 pounds.

3745. (Refer to figure 36.) If 50-pound weights are located at points X, Y, and Z, how would point Z have to be shifted to balance the plank?

A— 25 inches to the left.
B— 2.5 inches to the left.
C— 2.5 inches to the right.

3746. Based on this information, the CG would be located how far aft of datum?

Weight A ..... 120 lb at 15" aft of datum
Weight B ..... 200 lb at 117" aft of datum
Weight C ..... 5 lb at 195" aft of datum

A— 100.8 inches.
B— 109.0 inches.
C— 121.7 inches.

located how far aft of datum?

Weight X ..... 130 lb at 17" aft of datum
Weight Y ..... 110 lb at 110" aft of datum
Weight Z ..... 75 lb at 210" aft of datum

A— 89.1 inches.
B— 95.4 inches.
C— 106.9 inches.

3749. What is the maximum weight that could be added at Station 130.0 without exceeding the aft CG limit?

Total weight ..... 2,900 lb
CG location ..... Station 115.0
Aft CG limit ..... Station 116.0

A— 14 pounds.
B— 140 pounds.
C— 207 pounds.

3750. What would be the new CG location if 135 pounds of weight were added at Station 109.0?

Total weight ..... 2,340 lb
CG location ..... Station 103.0

A— Station 103.3.
B— Station 104.2.
C— Station 109.3.

3751. How much weight could be added at Station 160 without exceeding the aft CG limit?

Aircraft weight ..... 8,300 lb
CG location ..... Station 90.0
Aft CG limit ..... Station 90.5

A— 59.7 pounds.
B— 16.5 pounds.
C— 13.9 pounds.

added at Station 150.0 without exceeding the aft CG limit?

Aircraft weight ..... 5,000 lb
CG location ..... Station 80.0
Aft CG limit ..... Station 80.5

A— 70.0 pounds.
B— 69.5 pounds.
C— 35.9 pounds.

3754. What is the location of the CG if 90 pounds are removed from Station 140?

Aircraft weight ..... 6,230 lb
CG location ..... Station 79

A— 79.9.
B— 78.1.
C— 77.9.

3755. What is the location of the CG if 146 pounds are removed from Station 150?

Aircraft weight ..... 7,152 lb
CG location ..... Station 82

A— 83.4.
B— 81.3.
C— 80.6.

3756. What is the location of the CG if 60 pounds are removed from Station 70?

Aircraft weight ..... 8,420 lb
CG location ..... Station 85

A— 85.1.
B— 84.9.
C— 84.1.

3758. Could 100 pounds of weight be shifted from Station 130.0 to Station 30.0 without exceeding the forward CG limit?

Total weight ..... 2,800 lb
CG location ..... Station 120.0
Forward CG limit ..... Station 117.0

A— No; the new CG would be located at Station 116.89.
B— No; the new CG would be located at Station 116.42.
C— Yes; the new CG would be located at Station 117.89.

3759. Could 100 pounds of weight be shifted from Station 30.0 to Station 120.0 without exceeding the aft CG limit?

Total weight ..... 4,750 lb
CG location ..... Station 115.8
Aft CG limit ..... Station 118.0

A— Yes; the CG would remain at Station 115.8.
B— No; the new CG would be located at Station 118.15.
C— Yes; the new CG would be located at Station 117.69.

acceptable.
B— Yes; the weight and CG would be within limits after 254 pounds of fuel were consumed.
C— No; the weight exceeds the maximum allowable by 254 pounds, and the CG is aft of the aft limit.

3761. (Refer to figure 37.) Under these conditions, where is the CG located?

Empty weight (oil included) ..... 2,260.0 lb
Empty weight moment ..... 93.2 in-lb
Pilot and copilot ..... 380 lb
Center passengers ..... 240 lb
Aft passengers ..... 220 lb
Baggage ..... 120 lb
Fuel ..... 75 gal

A— Within the CG envelope.
B— On the aft limit of the CG envelope.
C— On the forward limit of the CG envelope.

3762. (Refer to figure 37.) If the airplane were loaded before takeoff as shown below, what would the total weight and moment be after 60.0 gallons of fuel have been used during flight?

Empty weight (oil not included) ..... 2,288.0 lb
Empty weight moment ..... 99.7 in-lb
Oil ..... 8 qt
Oil moment ..... –0.2
Pilot and copilot ..... 330.0 lb
Center passengers ..... 290 lb
Aft passengers ..... 170 lb
Baggage ..... 120 lb
Fuel ..... 70 gal

A— Weight 3,618.0 pounds; moment 184.5.
B— Weight 3,273.0 pounds; moment 168.8.
C— Weight 3,273.0 pounds; moment 184.5.

A— 3,131 pounds and 142.7 inch-pounds.
B— 3,146 pounds and 144.7 inch-pounds.
C— 3,566 pounds and 162.7 inch-pounds.

3764. (Refer to figure 38.) Determine the condition of the airplane:

Pilot and copilot	375 lb
Aft passengers	245 lb
Baggage	65 lb
Fuel	70 gal

A— 185 pounds under allowable gross weight; CG is located within limits.
B— 162 pounds under allowable gross weight; CG is located within limits.
C— 162 pounds under allowable gross weight; CG is located aft of the aft limit.

3765. (Refer to figure 38.) What would be the maximum allowable center of gravity in inches aft of datum if the airplane was loaded to 3,400 pounds gross weight?

A— 82.0 inches.
B— 84.5 inches.
C— 85.8 inches.

3766. (Refer to figure 38.) Determine the condition of the airplane:

Pilot and copilot	400 lb
Aft passengers	240 lb
Baggage	20 lb
Fuel	75 gal

A— 157 pounds under allowable gross weight; CG is located within limits.
B— 180 pounds under allowable gross weight; CG is located within limits.
C— 180 pounds under allowable gross weight, but CG is located aft of the aft limit.

A— 163 pounds under allowable gross weight; CG 82 inches aft of datum.
B— 197 pounds under allowable gross weight; CG 84.5 inches aft of datum.
C— 197 pounds under allowable gross weight; CG located outside aft limits.

3768. If the nosewheel of an airplane moves aft during gear retraction, how would this aft movement affect the CG location of that airplane? It would

A— cause the CG location to move aft.
B— have no effect on the CG location.
C— cause the CG location to move forward.

3769. If the landing gear on an airplane moves forward during retraction, the total moments will

A— increase.
B— decrease.
C— remain the same.

3770. The center of gravity of an aircraft is computed along the

A— lateral axis.
B— vertical axis.
C— longitudinal axis.

3771. The center of gravity of an aircraft can be determined by

A— dividing total arms by total moments.
B— dividing total moments by total weight.
C— multiplying total arms by total weight.

3772. In a twin-engine airplane, the single-engine service ceiling is the maximum density altitude at which V_{YSE} will produce

A— 50 feet per minute rate of climb.
B— 100 feet per minute rate of climb.
C— 500 feet per minute rate of climb.

airplane and when is it to be used?

A— It indicates the minimum speed at which the airplane is controllable when the critical engine is suddenly made inoperative and should be used at all altitudes when an engine is inoperative.
B— It indicates the speed which will provide the maximum altitude gain in a given time when one engine is inoperative and should be used for climb and final approach during engine-out operations.
C— It indicates the speed which will provide the greatest height for a given distance of forward travel when one engine is inoperative and should be used for all climbs during engine-out operations.

3775. When operating a light multiengine airplane at V_{MC}, the pilot should expect performance to be sufficient to maintain

A— heading.
B— heading and altitude.
C— heading, altitude, and be able to climb at 50 feet per minute.

3776. For an airplane with unsupercharged, reciprocating engines, V_{MC}

A— decreases with altitude.
B— increases with altitude.
C— is not affected by altitude.

3778. Which condition causes V_{MC} to be the highest?

A— CG is at the most forward allowable position.
B— CG is at the most rearward allowable position.
C— Gross weight is at the maximum allowable value.

3779. How does increased weight affect the takeoff distance of an airplane?

A— The airplane will accelerate more slowly with the same power output, but the same airspeed is required to generate necessary lift for takeoff.
B— The airplane will accelerate more slowly with the same power output, and a higher airspeed is required to generate necessary lift for takeoff.
C— Every airplane has the same acceleration factor with the same power output, but a higher airspeed is needed to overcome the increased ground effect.

3780. An airplane is loaded with the CG aft of the aft limit. What effect will this have on controllability?

A— Stall and spin recovery may be difficult or impossible.
B— A stall will occur at a lower airspeed, but recovery will be easier because of reduced wing loading.
C— A stall will occur at a higher indicated airspeed due to the greater downloading on the elevator.

3781. The stalling speed of an aircraft will be highest when the aircraft is loaded with a

A— high gross weight and aft CG.
B— low gross weight and forward CG.
C— high gross weight and forward CG.

3783. If the CG of an airplane is moved from the aft limit to beyond the forward limit, how will it affect the cruising and stalling speed?

A— Increase both the cruising speed and stalling speed.
B— Decrease both the cruising speed and stalling speed.
C— Decrease the cruising speed and increase the stalling speed.

3784. When an aircraft's forward CG limit is exceeded, it will affect the flight characteristics of the aircraft by producing

A— improved performance since it reduces the induced drag.
B— higher stalling speeds and more longitudinal stability.
C— very light elevator control forces which make it easy to inadvertently overstress the aircraft.

3785. As the CG moves aft, an airplane becomes

A— less stable and less controllable.
B— less stable, yet easier to control.
C— more stable and controllable as long as the aft CG is not exceeded.

3786. What is characteristic of the indicated airspeed if the CG is at the most forward allowable position and constant power and altitude are maintained?

A— There is no relationship between CG location and indicated airspeed.
B— Indicated airspeed will be less than it would be with the CG in the most rearward allowable position.
C— Indicated airspeed will be greater than it would be with the CG in the most rearward allowable position.

3788. Under which condition is a forward CG most critical?

A— On takeoff.
B— On landing.
C— When in an unusual attitude.

3789. As the CG location is changed, recovery from a stall becomes progressively

A— less difficult as the CG moves rearward.
B— more difficult as the CG moves rearward.
C— more difficult as the CG moves either forward or rearward.

3790. If the CG is located aft of allowable limits, the pilot may find it impossible to

A— raise the nose, if necessary, during flight in gusty wind conditions.
B— recognize this out-of-balance condition when hovering in strong headwinds.
C— fly in the upper allowable airspeed range due to insufficient forward cyclic control.

3791. While hovering immediately after lift-off, an excessive amount of forward cyclic is required to maintain the desired position over the ground. If flight is continued, this situation will be

A— aggravated if the fuel tanks are located aft of the CG.
B— unimproved regardless of the location of the fuel tanks.
C— aggravated if the fuel tanks are located forward of the CG.

be sufficient forward cyclic control available to lower the nose.

3793. The most favorable combination of conditions for rotorcraft performance is

A— low density altitude, low gross weight, and moderate to strong wind.
B— low density altitude, high gross weight, and calm to light wind.
C— high density altitude, low gross weight, and moderate to strong wind.

3794. If all other factors remain the same, an increase in relative humidity will

A— decrease the hovering ceiling because the air is less dense.
B— increase the hovering ceiling because the air is more dense.
C— decrease the hovering ceiling because the air is more dense.

3795. An aircraft is flying at a constant power setting and constant indicated altitude. As a result of a decrease in the outside air temperature, the true airspeed will

A— decrease, and the true altitude will decrease.
B— increase, and the true altitude will increase.
C— increase, and the true altitude will decrease.

3796. An aircraft is flying at a constant indicated altitude and a constant power setting. As a result of an increase in the outside air temperature, the true airspeed will

A— decrease, and the true altitude will decrease.
B— increase, and the true altitude will increase.
C— decrease, and the true altitude will increase.

when parasite drag is

A— equal to total drag.
B— equal to induced drag.
C— less than induced drag.

3799. The best lift/drag ratio of a glider is a value that

A— varies depending upon the weight being carried.
B— remains constant regardless of airspeed changes.
C— remains constant and is independent of the weight being carried.

3800. Which is true about the effect on a glider's performance by the addition of ballast or weight?

A— The glide ratio at a given airspeed will increase.
B— A higher airspeed is required to obtain the same glide ratio as when lightly loaded.
C— The heavier the glider is loaded, the less the glide ratio will be at all airspeeds.

3801. Unless otherwise specified, Federal airways extend from

A— 1,200 feet above the surface upward to 18,000 feet MSL and are 8 NM wide.
B— 1,200 feet above the surface upward to 14,500 feet MSL and are 16 NM wide.
C— 700 feet above the surface upward to the Continental Control Area and are 10 NM wide.

A— 20 NM and 1047 DST.
B— 23 NM and 1044 DST.
C— 25 NM and 1047 DST.

3803. GIVEN:

Departure path ..... straight out
Takeoff time 1435Z
Winds during climb ..... 175° at 25 kts
True course during climb ..... 155°
Airport elevation ..... 2,000 ft
True airspeed ..... 130 kts
Rate of climb ..... 500 ft/min

What would be the distance and time upon reaching 8,000 feet MSL?

A— 27 NM and 1455Z.
B— 24 NM and 1452Z.
C— 21 NM and 1447Z.

3804. GIVEN:

Distance ..... 340 SM
True course ..... 260°
Wind ..... 245° at 45 kts
True airspeed ..... 135 MPH
Rate of fuel consumption ..... 12.7 gal/hr

What would be the approximate groundspeed and amount of fuel consumed?

A— 74 knots; 50.1 gallons.
B— 84 MPH; 51.2 gallons.
C— 90 MPH; 47.3 gallons.
B— 127 MPH; 33.3 gallons.
C— 115 knots; 31.5 gallons.

3806. GIVEN:

Usable fuel at takeoff ..... 36 gal
Fuel consumption rate ..... 12.4 gal/hr
Constant groundspeed ..... 140 kts
Flight time since takeoff ..... 48 min

According to FAR Part 91, how much farther can an airplane be flown under day VFR?

A— 294 NM.
B— 224 NM.
C— 189 NM.

3807. GIVEN:

Usable fuel at takeoff ..... 36 gal
Fuel consumption rate ..... 12.4 gal/hr
Constant groundspeed ..... 140 kts
Flight time since takeoff ..... 48 min

According to FAR Part 91, how much farther can an airplane be flown under night VFR?

A— 189 NM.
B— 224 NM.
C— 294 NM.

3808. GIVEN:

Usable fuel at takeoff ..... 36 gal
Fuel consumption rate ..... 12.4 gal/hr
Constant groundspeed ..... 140 kts
Flight time since takeoff ..... 48 min

According to FAR Part 91, how much farther can a rotorcraft be flown under VFR?

A— 294 NM.
B— 247 NM.
C— 224 NM.

C— 121 NM.

3810. GIVEN:

Usable fuel at takeoff ..... 40 gal
Fuel consumption rate ..... 12.2 gal/hr
Constant groundspeed ..... 120 kts
Flight time since takeoff ..... 1 hr 30 min

According to FAR Part 91, how much farther can an airplane be flown under night VFR?

A— 216 NM.
B— 156 NM.
C— 121 NM.

3811. GIVEN:

Usable fuel at takeoff ..... 40 gal
Fuel consumption rate ..... 12.2 gal/hr
Constant groundspeed ..... 120 kts
Flight time since takeoff ..... 1 hr 30 min

According to FAR Part 91, how much farther can a rotorcraft be flown under day VFR?

A— 215 NM.
B— 176 NM.
C— 121 NM.

3812. If fuel consumption is 15.3 gallons per hour and groundspeed is 167 knots, how much fuel is required for an aircraft to travel 620 NM?

A— 63 gallons.
B— 60 gallons.
C— 57 gallons.

A— 28 gallons.
B— 30 gallons.
C— 33 gallons.

3815. On a cross-country flight, point C is crossed at 0900 hours and the plan is to reach point D at 0925 hours. Use the following information to determine the indicated airspeed required to reach point D on schedule.

Distance between C and D ..... 68 NM
Forecast wind ..... 295° at 25 kts
Pressure altitude ..... 7,000 ft
Ambient temperature ..... +10 °C
True course ..... 175°

The required indicated airspeed would be approximately

A— 135 knots.
B— 144 knots.
C— 166 knots.

3816. On a cross-country flight, point A is crossed at 1500 hours and the plan is to reach point B at 1530 hours. Use the following information to determine the indicated airspeed required to reach point B on schedule.

Distance between A and B ..... 70 NM
Forecast wind ..... 310° at 15 kts
Pressure altitude ..... 8,000 ft
Ambient temperature ..... –10 °C
True course ..... 270°

The required indicated airspeed would be approximately

A— 126 knots.
B— 137 knots.
C— 152 knots.

The required indicated airspeed would be approximately

A— 162 knots.
B— 140 knots.
C— 128 knots.

3818. On a cross-country flight, point X is crossed at 1550 and the plan is to reach point Y at 1620. Use the following information to determine the indicated airspeed required to reach point Y on schedule.

Distance between X and Y ..... 70 NM
Forecast wind ..... 115° at 25 kts
Pressure altitude ..... 9,000 ft
Ambient temperature ..... –05 °C
True course ..... 088°

The required indicated airspeed would be approximately

A— 138 knots.
B— 143 knots.
C— 162 knots.

3819. If the groundspeed is 215 knots, how far will the aircraft travel in 3 minutes' elapsed time?

A— 3.58 NM.
B— 6.45 NM.
C— 10.75 NM.

3820. How far will an aircraft travel in 2-1/2 minutes with a groundspeed of 98 knots?

A— 2.45 NM.
B— 3.35 NM.
C— 4.08 NM.

A— 8°.
B— 11°.
C— 14°.

3823. After 150 miles are flown from the departure point, the aircraft's position is located 8 miles off course. If 160 miles remain to be flown, what approximate total correction should be made to converge on the destination?

A— 6°.
B— 9°.
C— 12°.

3824. After 155 miles are flown from the departure point, the aircraft's position is located 10 miles off course. If 80 miles remain to be flown, what approximate total correction should be made to converge on the destination?

A— 9°.
B— 11°.
C— 14°.

3825. After 240 miles are flown from the departure point, the aircraft's position is located 25 miles off course. If 100 miles remain to be flown, what approximate total correction should be made to converge on the destination?

A— 15°.
B— 21°.
C— 30°.

3826. A true heading of 125° results in a ground track of 115°. With a true airspeed of 160 MPH and a groundspeed of 135 MPH, the wind is from

A— 073° and 36 MPH.
B— 164° and 37 MPH.
C— 175° and 36 MPH.

would be from

A— 015° and 30 knots.
B— 035° and 40 knots.
C— 290° and 40 knots.

3829. If a true heading of 230° results in a ground track of 250° and a true airspeed of 160 knots results in a groundspeed of 175 knots, the wind would be from

A— 135° and 59 knots.
B— 165° and 60 knots.
C— 343° and 60 knots.

3830. Which statement about longitude and latitude is true?

A— Lines of longitude are parallel to the Equator.
B— Lines of longitude cross the Equator at right angles.
C— The 0° line of latitude passes through Greenwich, England.

3831. When planning a distance flight, true course measurements on a Sectional Aeronautical Chart should be made at a meridian near the midpoint of the course because the

A— values of isogonic lines change from point to point.
B— angles formed by lines of longitude and the course line vary from point to point.
C— angles formed by isogonic lines and lines of latitude vary from point to point.

point B of the wind triangle represents

A— true heading and airspeed.
B— true course and groundspeed.
C— groundspeed and true heading.

3834. (Refer to figure 39.) The line from point B to point C of the wind triangle represents

A— airspeed and heading.
B— groundspeed and true course.
C— true heading and groundspeed.

3835. (Refer to figure 39.) The line from point C to point A of the wind triangle represents

A— wind direction and velocity.
B— true course and groundspeed.
C— true heading and groundspeed.

3836. When converting from true course to magnetic heading, a pilot should

A— subtract easterly variation and right wind correction angle.
B— add westerly variation and subtract left wind correction angle.
C— subtract westerly variation and add right wind correction angle.

3837. When converting from magnetic course to true course, a pilot should

A— add easterly variation regardless of heading.
B— add westerly variation regardless of heading.
C— subtract easterly variation when on a heading of 360°.

3838. When converting from true heading to true course, a pilot should

A— add right wind correction angle.
B— add left deviation correction angle.
C— subtract right wind correction angle.

Ambient temperature ..... +05 °C
Pressure altitude ..... 6,500 ft
Forecast wind ..... 350° at 30 kts

Under these conditions, the magnetic heading and groundspeed would be approximately

A— 260° and 155 knots.
B— 270° and 157 knots.
C— 280° and 155 knots.

3841. GIVEN:

True course ..... 330°
Variation ..... 15° E
Indicated airspeed ..... 160 kts
Ambient temperature ..... –10 °C
Pressure altitude ..... 4,500 ft
Forecast wind ..... 090° at 25 kts

Under these conditions, the magnetic heading and groundspeed would be approximately

A— 323° and 177 knots.
B— 332° and 166 knots.
C— 340° and 177 knots.

3842. GIVEN:

True course ..... 238°
Variation ..... 3° W
Indicated airspeed ..... 160 kts
Ambient temperature ..... –15 °C
Pressure altitude ..... 8,500 ft
Forecast wind ..... 160° at 25 kts

Under these conditions, the magnetic heading and groundspeed would be approximately

A— 224° and 171 knots.
B— 233° and 171 knots.
C— 241° and 178 knots.

indication 1, what will be the relative bearing to the station when you intercept the 090° magnetic bearing to the station?

A— 260°.
B— 270°.
C— 280°.

3845. (Refer to figure 40.) If on a magnetic heading of 030° and receiving ADF indication 5, to what heading should the aircraft be turned to intercept the 150° bearing from the station at a 30° angle?

A— 210°.
B— 180°.
C— 120°.

3846. (Refer to figure 40.) If on a magnetic heading of 270° and receiving ADF indication 2, to what heading should the aircraft be turned to intercept the 350° bearing from the station at a 20° angle?

A— 190°.
B— 290°.
C— 330°.

3847. (Refer to figure 40.) If on a magnetic heading of 240° and receiving ADF indication 2, what would be the magnetic bearing to the station?

A— 180°.
B— 240°.
C— 360°.

3848. (Refer to figure 40.) If on a magnetic heading of 310° and receiving ADF indication 3, what would be the magnetic bearing to the station?

A— 085°.
B— 135°.
C— 315°.

A— 2.
B— 4.
C— 6.

3851. (Refer to figure 40.) If on a magnetic heading of 120°, which ADF indicator would show a magnetic bearing to the station of 210°?

A— 1.
B— 3.
C— 4.

3852. What is the relationship of VHF radio reception and altitude?

A— VHF reception distance varies in proportion to the altitude of the receiving equipment.
B— Unlike reception with low or medium frequency (L/MF) equipment, VHF reception is not subject to line-of-sight restrictions.
C— Reception of VHF signals is more subject to signal fades and interference from distant stations than reception of low or medium frequency (L/MF) signals.

3853. The normal usable range of an L class VOR below 18,000 feet is

A— 25 NM.
B— 40 NM.
C— 100 NM.

3854. The normal usable range of a T class VOR below 12,000 feet is

A— 100 NM.
B— 40 NM.
C— 25 NM.

C— 130 NM.

3857. (Refer to figure 41.) At which aircraft position(s) would you receive OMNI indication V?

A— 2 only.
B— 6 only.
C— 5 and 8.

3858. (Refer to figure 41.) At which aircraft position(s) would you receive OMNI indication X?

A— 1 and 3.
B— 3 and 7.
C— 7 only.

3859. (Refer to figure 41.) At which aircraft position(s) would you receive OMNI indication U?

A— 1 and 2.
B— 2 only.
C— 6 only.

3860. (Refer to figure 41.) Which OMNI indication would you receive for aircraft 8?

A— T.
B— V.
C— W.

3861. (Refer to figure 41.) Which OMNI indications would you receive for aircraft 5 and 7?

A— T and X.
B— V and X.
C— W and Z.

3862. (Refer to figure 42.) Which RMI indicator shows your position to be northwest of the station?

A— 2.
B— 3.
C— 6.

C— 115°.

3865. (Refer to figure 42.) Which RMI indicator shows you outbound on the 315° radial?

A— 1.
B— 4.
C— 9.

3866. In reference to low frequency radio wave propagation, the distance between the transmitting antenna and the point where the sky wave first returns to the ground is called the

A— skip zone.
B— ground wave.
C— skip distance.

3867. The very high frequency radio band is from

A— 30 to 300 kHz.
B— 30 to 300 MHz.
C— 300 to 3000 kHz.

3868. Which distance is commonly displayed by a DME indicator?

A— Slant-range distance in statute miles.
B— Slant-range distance in nautical miles.
C— The distance from the aircraft to a point at the same altitude directly above the VORTAC.

3869. Which DME indication should you receive when you are directly over a VORTAC site at approximately 6,000 feet AGL?

A— 0.
B— 1.
C— 1.3.

C— nautical miles left or right of course.

3872. If you are 30 miles from the NDB transmitter and the ADF indicates 3° off course, how many miles off course are you?

A— 1.5.
B— 3.
C— 6.

3873. Which statement is true regarding tracking a desired bearing when using ADF during crosswind conditions?

A— To track outbound, heading corrections should be made away from the ADF pointer.
B— When on the desired track inbound with the proper drift correction established, the ADF pointer will be deflected to the windward side of the nose position.
C— When on the desired track outbound with the proper drift correction established, the ADF pointer will be deflected to the windward side of the tail position.

3874. The ADF is tuned to a nondirectional radio beacon and the relative bearing changes from 090° to 100° in 1.5 minutes' elapsed time. The time en route to the station would be

A— 6 minutes.
B— 9 minutes.
C— 15 minutes.

3875. The ADF indicates a 5° wingtip bearing change in 2.5 minutes' elapsed time. If the true airspeed is 125 knots, the distance to the station would be

A— 31.2 NM.
B— 56.5 NM.
C— 62.5 NM.

270° radial of a VOR is crossed at 1037 and the 260° radial at 1042. The approximate time and distance to the station would be

A— 30 minutes and 65 NM.
B— 42 minutes and 104 NM.
C— 44 minutes and 96 NM.

3878. NDB's normally operate in the frequency range of

A— 190 to 535 kHz.
B— 400 to 1020 Hz.
C— 962 to 1213 MHz.

3879. When using a VOT to check the accuracy of a VOR receiver with an RMI, what should the RMI indicate if no error exists?

A— 180° FROM.
B— 180° TO.
C— 360° TO.

3880. When using a VOT to check the accuracy of a VOR receiver, with the CDI centered, what should the OBS indicate if no error exists?

A— 360° TO, 270° FROM.
B— 180° FROM, 360° TO.
C— 180° TO, 360° FROM.

3881. A particular VORTAC station is undergoing routine maintenance. This is evidenced by

A— removal of the identification feature.
B— removal of the voice feature of the TACAN.
C— transmitting a series of dashes after each identification signal.

A— DME operates in the VHF frequency band.
B— Distance information received from DME is the actual horizontal distance from the station.
C— DME coded identification is transmitted once for each three or four times that the VOR coded identification is transmitted.

3884. Up to 199 NM at line-of-sight altitudes, the accuracy of DME systems is better than

A— 1 mile or 6 percent of the distance, whichever is less.
B— 1 mile or 3 percent of the distance, whichever is greater.
C— one-half mile or 3 percent of the distance, whichever is greater.

3885. When designated in conjunction with an airport which has a published instrument approach procedure, what airspace is defined as a transition area?

A— The airspace extending upward from the surface to 3,000 feet within a 5 SM radius from the center of an airport.
B— That airspace extending upward from 700 feet or more AGL and terminating at the base of the overlying controlled airspace.
C— That airspace extending upward from the surface and terminating at the base of the overlying Continental Control Area.

3886. Within the conterminous United States, the floor of the positive control area is

A— 14,500 feet MSL.
B— 18,000 feet MSL.
C— 24,000 feet MSL.

A— 3,000 feet MSL.
B— 18,000 feet MSL.
C— the base of the overlying controlled airspace.

3889. Within the contiguous United States, the vertical limit of control zones extends from the surface upward to

A— but not including, 3,000 feet AGL.
B— but not including, 10,000 feet MSL.
C— the base of the Continental Control Area.

3890. One of the major differences between control zones and transition areas is that all control zones

A— are located around tower-controlled airports only.
B— always begin at 700 feet AGL while transition areas always begin at 1,200 feet above the surface.
C— begin at the surface, while all transition areas begin at an altitude of 700 feet or higher above the surface.

3891. (Refer to figure 43.) The minimum avionics equipment necessary to operate in the airspace below 6,000 feet MSL and above 1,000 feet AGL over Washington National Airport (area A) is

A— transponder, encoding altimeter, and VOR.
B— two-way radio communications, transponder, and VOR.
C— two-way radio communications, transponder, and encoding altimeter.

3892. (Refer to figure 43.) The airspace overlying Davison Army Airfield (area C) is

A— uncontrolled from the surface to 700 feet AGL.
B— a control zone from the surface to 14,500 feet MSL.
C— an airport traffic area from the surface to 3,000 feet MSL.

(area D) is

A— 3,146 feet AGL.
B— 4,200 feet MSL.
C— 4,200 feet AGL.

3895. (Refer to figure 43.) The base of the outer circle of the ARSA at Dulles International Airport (area B) is

A— 700 feet AGL.
B— 1,200 feet AGL.
C— 1,700 feet MSL.

3896. (Refer to figure 43.) The airspace overlying Baltimore-Washington International Airport (area D) from the surface to 4,200 feet MSL is

A— a TCA.
B— an ARSA.
C— an airport traffic area.

3897. (Refer to figure 43.) At what altitude does the TCA begin over Bower Airport (area E)?

A— Surface.
B— 1,500 feet MSL.
C— 2,500 feet AGL.

3898. (Refer to figure 43.) When, if ever, are two-way radio communications required on a flight from Godfrey Field (area F) to Freeway Airport (area G) at an altitude of 1,000 feet AGL?

A— None required.
B— When in the TCA and the Dulles ARSA.
C— When flying through the Dulles control zone.

3899. (Refer to figure 43.) What is the floor of the ARSA over Tipton Army Airfield (area H)?

A— 1,300 feet AGL.
B— 1,700 feet MSL.
C— 2,500 feet MSL.

traffic areas, the San Antonio Airport Radar Service Area, and Randolph AFB restricted area.

3901. (Refer to figure 44.) Where does the floor of controlled airspace begin over Boening Airport (area G)?

A— 700 feet AGL.
B— 1,200 feet MSL.
C— 1,200 feet AGL.

3902. (Refer to figure 44.) Where does the floor of controlled airspace begin over Devine Airport (area B)?

A— Surface.
B— 700 feet MSL.
C— 1,402 feet MSL.

3903. (Refer to figure 44.) What is the ceiling of the San Antonio Airport Radar Service Area (area D)?

A— 3,000 feet MSL.
B— 4,800 feet MSL.
C— 4,800 feet AGL.

3904. (Refer to figure 44.) The airspace over Kelly AFB Airport (area F) which begins at the surface and terminates at 14,500 feet is

A— a control zone.
B— a military operations area.
C— an airport radar service area.

3906. (Refer to figure 44.) What are the requirements for operating in the alert area surrounding Randolph AFB (area H)?

A— Prior permission must be obtained from the controlling agency.
B— Contact with approach control on frequency 118.9 is required.
C— There are no requirements, but pilots should be extremely cautious due to extensive student training.

3907. (Refer to figure 44.) On what frequency is Automatic Terminal Information Service transmitted at San Antonio International Airport (area D)?

A— 118.9.
B— 119.8.
C— 122.95.

3908. (Refer to figure 44.) Select the correct statement concerning the obstruction 17 SM north of Pleasanton Airport (area A).

A— The obstruction is unlighted.
B— The obstruction has high-intensity lights.
C— The elevation of the top of the obstruction is 1,639 feet AGL.

3909. (Refer to figure 44.) What is the elevation of the top of the double obstruction 4 SM southwest of Pleasanton Airport (area A)?

A— 320 feet AGL.
B— 460 feet MSL.
C— 780 feet MSL.

(area D)?

A— 4,500 feet MSL.
B— 5,000 feet MSL.
C— 8,000 feet MSL.

3912. (Refer to figure 45.) When, if ever, are two-way radio communications required if en route from Lancaster Airport (area C) direct to Dallas North Airport (area E) at 3,000 feet MSL?

A— When entering the terminal control area.
B— When entering the airport radar service area.
C— When transitioning through Dallas Love and Addison airport traffic areas.

3913. (Refer to figure 45.) Where does the floor of controlled airspace begin over Dallas North Airport (area E)?

A— 700 feet AGL.
B— 1,200 feet AGL.
C— 5,000 feet MSL.

3914. (Refer to figure 45.) The airspace beginning at 3,000 feet MSL over Addison Airport (area D) is

A— a control zone.
B— a terminal control area.
C— an airport radar service area.

3915. (Refer to figure 45.) What does the figure 1^{7} (area F) indicate?

A— Minimum safe altitude for that quadrangle.
B— Maximum elevation figure for that quadrangle.
C— Height above ground of the tallest obstruction for that quadrangle.

B— The VORTAC frequency has no voice capability.
C— A pilot may receive transmissions from Dallas FSS over the VORTAC frequency.

3918. (Refer to figure 45.) What is the elevation of Lancaster Airport (area C)?

A— 50 feet MSL.
B— 500 feet MSL.
C— 988 feet MSL.

3919. (Refer to figure 46.) What is the normal radius of the outer area (area B)?

A— 10 NM.
B— 20 NM.
C— 25 NM.

3920. (Refer to figure 46.) What is the radius of the inner circle (circle C)?

A— 5 miles.
B— 10 miles.
C— 15 miles.

3921. (Refer to figure 46.) What is the radius of the outer circle (circle A)?

A— 5 miles.
B— 10 miles.
C— 15 miles.

3922. (Refer to figure 46.) Which altitude (box 2) is applicable to the base of the outer circle?

A— 700 feet AGL.
B— 1,000 feet AGL.
C— 1,200 feet AGL.

B— Two-way communications and transponder with automatic altitude reporting capability.
C— Two-way communications, transponder with automatic altitude reporting capability, and VOR.

3925. To operate an aircraft from a satellite airport within an ARSA, the pilot must

A— monitor ATC until clear of the ARSA.
B— contact ATC as soon as practicable after takeoff.
C— secure prior approval from ATC before takeoff at the airport.

3926. All operations within an ARSA must be

A— in compliance with ATC clearances and instructions.
B— on a flight plan filed prior to arrival or departure.
C— in an aircraft equipped with a 4096 transponder with automatic altitude reporting capability.

3927. Flight through a restricted area should not be accomplished unless the pilot has

A— filed a VFR flight plan.
B— received prior authorization from the controlling agency.
C— received prior permission from the commanding officer of the nearest military base.

3929. Where are warning areas established?

A— In mountainous areas.
B— Beyond the nation's 3-mile limit.
C— In the vicinity of military bases.

3930. Airspace established as warning areas are located

A— in international airspace.
B— in the immediate vicinity of military bases.
C— along military low-altitude training routes.

3931. A military operations area (MOA) is airspace of defined vertical and lateral limits established for the purpose of

A— separating certain military training activities from IFR traffic.
B— military services conducting VFR low altitude navigation, tactical training, and flight testing.
C— denoting the existence of unusual hazards to aircraft, such as artillery firing, aerial gunnery, or guided missiles.

3932. When operating VFR in a military operations area (MOA), a pilot

A— must operate only when military activity is not being conducted.
B— should exercise extreme caution when military activity is being conducted.
C— must obtain a clearance from the controlling agency prior to entering the MOA.

3933. The purpose of designating certain airspace as a transition area is to

A— extend the lateral limits of a control zone.
B— enable ATC to control all flights within a given area.
C— ensure that IFR flights can remain within controlled airspace for terminal operations.

3935. An airport traffic area extends upward to, but does not include,

A— 2,000 feet AGL.
B— 3,000 feet MSL.
C— 3,000 feet AGL.

3936. Airport traffic areas are in effect at all airports where

A— an FSS is in operation.
B— a control tower is in operation.
C— the airport is located within the lateral limits of controlled airspace.

3937. Airport advisory areas exist only at airports with

A— operating FSS's.
B— operating control towers.
C— Automatic Terminal Information Service.

3938. What is an airport advisory area?

A— That airspace within 10 SM of an airport which does not have a control tower but where an FSS is located.
B— That airspace within 5 SM of an airport extending up to, but does not include 3,000 feet, within which a control tower is in operation.
C— That airspace identified by an area on the surface within which flight of an aircraft is subject to special restrictions.

3939. If a military training route will have flights operating at or below 1,500 feet AGL, it will be designated by

A— VR and a three digit number only.
B— IR or VR and a four digit number.
C— IR or VR and a three digit number.

C— IFR Low Altitude En Route Chart.

3942. Radar service available under the terminal radar program for VFR aircraft provides

A— separation between all VFR and IFR aircraft within the TRSA.
B— traffic information and positive control of all aircraft within the TCA.
C— traffic information and limited vectoring to VFR aircraft on a workload permitting basis.

3943. Stage III Service within a TRSA utilizes radar to provide

A— separation between all VFR aircraft operating within the TRSA.
B— radar vectoring if the weather minimums are below VFR conditions.
C— separation between all participating VFR aircraft and IFR aircraft operating within the TRSA.

3944. How is a control zone depicted on Sectional Aeronautical Charts?

A— A blue airport symbol.
B— A blue dashed line encircling the airport.
C— A magenta colored band surrounding the airport.

3945. Sectional charts for the conterminous United States are updated each

A— 3 months.
B— 6 months.
C— 12 months.

A— elevator should be placed in the up position.
B— elevator should be placed in the down position.
C— aileron on the downwind side should be placed in the down position.

3948. Which aileron position should you generally use when taxiing in strong quartering headwinds?

A— Neutral.
B— Aileron up on the side from which the wind is blowing.
C— Aileron down on the side from which the wind is blowing.

3949. When taxiing with strong quartering tailwinds, which aileron position should be used?

A— Neutral.
B— Aileron up on the side from which the wind is blowing.
C— Aileron down on the side from which the wind is blowing.

3950. Why should an airplane be headed into the wind for the pretakeoff check?

A— To prevent the need for more brake pressure to keep the airplane from moving forward.
B— To prevent excessive load factors which could occur during run-up if a crosswind condition exists.
C— To obtain more accurate operating indications and to minimize engine overheating when the engine is run up.

3951. Select the four flight fundamentals involved in maneuvering an aircraft.

A— Aircraft power, pitch, bank, and trim.
B— Starting, taxiing, takeoff, and landing.
C— Straight-and-level flight, turns, climbs, and descents.

the aircraft swings slightly to the left before it swings along the horizon to the right. This is a

A— slipping entry, caused by excessive right rudder pressure.
B— skidding entry; more right rudder pressure and less right aileron pressure should have been applied.
C— slipping entry; more right rudder pressure should have been applied for the amount of aileron pressure being used.

3954. What will cause the nose of an aircraft to move in the direction of the turn before the bank starts in a turn entry?

A— Rudder being applied too late.
B— Rudder being applied too soon.
C— Failure to apply back elevator pressure.

3955. How should a student be taught to correct for a nose-low attitude during a steep turn?

A— Apply back elevator pressure to attain the desired pitch attitude.
B— Reduce the angle of bank, then apply back elevator pressure to attain the desired pitch attitude.
C— Apply back elevator pressure to attain the desired pitch attitude, then reduce the angle of bank.

3956. While holding a constant angle of bank in a coordinated turn, the displacement of the turn needle will

A— increase as airspeed decreases.
B— increase as airspeed increases.
C— remain constant regardless of airspeed.

while maintaining a constant load factor would result in

A— a decrease in radius of turn.
B— an increase in radius of turn.
C— an increase in centrifugal force.

3959. Which is the best technique for minimizing the wing-load factor when flying in severe turbulence?

A— Control airspeed with power, maintain wings level, and accept variations of altitude.
B— Control airspeed as closely as possible with elevator and power, and accept variations of bank and altitude.
C— Set power and trim to obtain an airspeed at or below maneuvering speed, maintain wings level, and accept variations of airspeed and altitude.

3960. When explaining the techniques used for making short- and soft-field takeoffs, it would be correct to state that

A— during soft-field takeoffs, lift-off should be made as soon as possible.
B— during soft-field takeoffs, lift-off should be made only when best angle-of-climb speed is attained.
C— during short-field takeoffs, lift-off should be attempted only after best rate-of-climb speed is attained.

3961. The indicated lift-off airspeed for short-field takeoffs in a particular airplane will normally be

A— the same as for soft- or rough-field takeoffs.
B— greater than for soft- or rough-field takeoffs.
C— greater under tailwind conditions than that required under headwind conditions.

3963. Under normal conditions, a proper crosswind landing on a runway requires that, at the moment of touchdown, the

A— direction of motion of the airplane and its longitudinal axis be parallel to the runway.
B— downwind wing be lowered sufficiently to eliminate the tendency for the airplane to drift.
C— direction of motion of the airplane and its lateral axis be perpendicular to the runway.

3964. During a power approach to a short-field landing, the correct airspeed may be verified by

A— the ability to land on a predetermined spot.
B— little or no floating during the landing flare.
C— the ability to maintain a constant angle of descent.

3965. If an emergency situation requires a downwind landing, pilots should expect a faster

A— airspeed at touchdown, a longer ground roll, and better control throughout the landing roll.
B— groundspeed at touchdown, a longer ground roll, and the likelihood of overshooting the desired touchdown point.
C— groundspeed at touchdown, a shorter ground roll, and the likelihood of undershooting the desired touchdown point.

3966. On final approach to landing, a faster-than-normal indicated airspeed should be used when

A— turbulent conditions exist.
B— ambient temperatures are above 90 °F.
C— landing at airports above 5,000 feet MSL with above standard temperature conditions.

3968. A go-around from a poor landing approach should

A— not be attempted unless circumstances make it absolutely necessary.
B— generally be preferable to last minute attempts to prevent a bad landing.
C— not be attempted after the landing flare has been initiated regardless of airspeed.

3969. During go-arounds from a full-flap approach in conventional airplanes, which procedure should be used if the flight manual does not specify differently?

A— Start retracting the flaps first, then retract the gear.
B— Retract the gear first and adjust flaps only after reaching a safe altitude.
C— Retract the gear first since it has a far greater adverse effect on aircraft performance than do flaps.

3970. One reason a student tends to round out high during landing is

A— changing focus gradually.
B— focusing on references too far ahead.
C— focusing on references that are too close or looking directly down.

3971. What could be a result of a student focusing too far ahead during a landing approach?

A— Reactions will be either too abrupt or too late.
B— Rounding out too high and developing an excessive sink rate.
C— Difficulty in judging the closeness of the ground resulting in a nose-first touchdown.

rate of descent is to

A— increase rotor lift by applying aft cyclic pressure.
B— increase power, and if altitude permits, lower the nose.
C— lower the nose immediately, but do not increase the power since this will again raise the nose.

3974. What normally results from excessive airspeed on final approach?

A— Bouncing.
B— Floating.
C— Ballooning.

3975. What normally results from misjudging the rate of sink during a landing?

A— Floating.
B— Ballooning.
C— Poor directional control.

3976. What procedure should be used to correct for slight ballooning during landing?

A— Decrease power.
B— Decrease angle of attack.
C— Hold a constant landing attitude.

3977. To properly compensate for a crosswind during straight-and-level cruising flight, the pilot should

A— hold rudder pressure toward the wind.
B— establish a proper heading into the wind by coordinated use of the controls.
C— hold aileron pressure toward the wind and hold opposite rudder pressure to prevent a turn.

A— Corners 1 and 4.
B— Corners 1 and 2.
C— Corners 2 and 4.

3980. (Refer to figure 47.) In flying the rectangular course, when would the aircraft be turned more than 90°?

A— Corners 2 and 3.
B— Corners 1 and 3.
C— Corners 2 and 4.

3981. (Refer to figure 47.) In flying the rectangular course, when should the aircraft bank vary from a steep bank to a medium bank?

A— Corner 1.
B— Corner 3.
C— Corners 2 and 3.

3982. (Refer to figure 47.) In flying the rectangular course, which would describe the proper angle of bank?

A— Corner 1 shallow, corner 2 medium, corner 3 steep, and corner 4 shallow.
B— Corner 1 shallow, corner 2 medium to steep, corner 3 steep, and corner 4 medium to shallow.
C— Corner 1 shallow to medium, corner 2 medium to steep, corner 3 steep to medium, and corner 4 medium to shallow.

3983. (See figure 48.) At which points will the wing (lateral axis) be in alignment with the pylon during turns around a point?

A— 1 and 3.
B— 2 and 4.
C— 1, 2, 3, and 4.

abeam the point headed directly

A— crosswind.
B— downwind only.
C— upwind or downwind.

3986. (Refer to figure 49.) The groundspeed will be equal in which positions?

A— 1 and 5 only.
B— 1 and 5, 2 and 4, 6 and 8.
C— 1 and 5, 2 and 8, 4 and 6.

3987. (Refer to figure 49.) The angle of bank will be most nearly equal in which positions?

A— 3 and 7.
B— 1 and 5.
C— 4 and 6.

3988. (Refer to figure 50.) With the wind as shown and the bank constant throughout the turn, which of the ground tracks illustrated would be most probable?

A— 1.
B— 2.
C— 4.

3989. (Refer to figure 51.) In which positions will the groundspeeds be equal?

A— 2 and 5.
B— 1 and 6, 2 and 5.
C— 1 and 6, 2 and 5, 3 and 4.

3990. (Refer to figure 51.) During S-turn practice, which positions require the steeper angle of bank?

A— 4 and 5.
B— 3 and 4.
C— 2 and 5.

turn is not completed before crossing the road or reference line. This would most likely occur in turn

A— 1-2-3 because the bank is decreased too rapidly during the latter part of the turn.
B— 4-5-6 because the bank is increased too rapidly during the early part of the turn.
C— 4-5-6 because the bank is increased too slowly during the latter part of the turn.

3993. In properly coordinated eights-on-pylons, if the reference point is behind the pylon, it means the

A— angle of bank is too shallow.
B— airplane is above the pivotal altitude.
C— airplane is below the pivotal altitude.

3994. The pivotal altitude for eights-on-pylons is dependent primarily upon the

A— groundspeed.
B— true airspeed.
C— distance from the pylon.

3995. If the wing moves behind the pylon during properly coordinated eights-on-pylons, the airplane is

A— flying too fast.
B— below pivotal altitude.
C— above pivotal altitude.

3996. (Refer to figure 53.) While performing eights-on-pylons, the turn-and-slip indicator appears as shown in "2." The pilot must

A— increase altitude to obtain the correct pivotal altitude, and correct the skidding turn.
B— decrease altitude to obtain the correct pivotal altitude, and correct the slipping turn.
C— decrease the bank to hold the reference point on the pylon without slipping, because the radius of turn is too small.

demonstration is to

A— emphasize the hazard of an excessive slip during a landing approach.
B— teach the proper recovery technique should this type of stall occur during final approach.
C— show the effect of improper control technique and emphasize the importance of coordinated control when making turns.

3999. Two distinct flight situations should be covered when teaching slow flight. These are the establishment and maintenance of

A— airspeeds appropriate for landing approaches, and flight at minimum controllable speeds.
B— an airspeed which gives a stall warning indication, and a speed at which complete recovery can be made from stalls.
C— a speed at which the airplane is operating on the back side of the power curve, and a speed at which the elevator control can be held full-back with no further loss of control.

4000. The primary purpose of practicing operations at minimum controllable airspeeds is to enable students to

A— safely fly airport traffic patterns at various airspeeds.
B— develop proficiency at anticipating the onset of power-on stalls.
C— become familiar with appropriate control techniques for such speeds, and the rapidity with which control effectiveness can be lost.

turn, in which direction would the airplane tend to roll?

A— Toward the inside of the turn.
B— Toward the outside of the turn.
C— The direction of roll depends on whether the airplane is slipping, skidding, or in coordinated flight.

4003. Students should be taught that throughout a level, 720° steep turn to the right, the rudder is normally used to

A— prevent yawing.
B— control the rate of turn.
C— hold the aircraft in the turn once it is established.

4004. Pilots who initiate a chandelle with a bank that is too steep will most likely

A— stall before completing the maneuver.
B— turn more than 180° before completing the rollout.
C— perform a comparatively level steep turn with a nose-high rollout at the 180° point.

4005. What may occur if the initial bank is too shallow when performing a chandelle?

A— Completing the maneuver with excessive airspeed.
B— Stalling the aircraft before reaching the 180° point.
C— Completing the maneuver with too low a pitch attitude.

4006. When performing a chandelle, where should maximum pitch occur?

A— 45° point.
B— 90° point.
C— 180° point.

C— Constant bank and changing pitch.

4009. When performing a lazy eight, where should the maximum pitchup attitude occur?

A— 45° point.
B— 90° point.
C— 180° point.

4010. When performing a lazy eight, when should the aircraft be at minimum airspeed?

A— 45° point.
B— 90° point.
C— 180° point.

4011. When performing a lazy eight, where should the maximum pitchdown attitude occur?

A— 90° point.
B— 135° point.
C— 180° point.

4012. When performing a lazy eight, when should the maximum altitude occur?

A— 45° point.
B— 90° point.
C— 180° point.

4013. When performing a lazy eight, when should the altitude be the same as the entry altitude?

A— 90° point.
B— 135° point.
C— 180° point.

during a lazy eight?

A— Beginning with too slow a rate of roll.
B— Beginning with too rapid a rate of roll.
C— Allowing the airspeed to remain too high causing the rate of turn to increase.

4016. Which is the most probable result if a pilot initiates the climbing turn portions of the lazy eight with banks that are too steep?

A— Completing each 180° change of direction with a net gain of altitude.
B— Attaining a pitch attitude that is too steep and stalling at the top of the climbing turn.
C— Turning at a rate too fast for the rate of climb and therefore, completing each 180° change of direction with excessive airspeed.

4017. At what point, if ever, in a lazy eight is it most likely that it will be necessary to exert opposing aileron and rudder pressures in order to maintain coordinated flight?

A— At the point of slowest speed.
B— At the point of fastest speed.
C— At the point of lowest pitch attitude.

4018. (Refer to figure 53.) During practice of lazy eights, the most probable cause of the uncoordinated situation at the completion of 90° of turn (indicated by the turn-and-slip indicator shown in "1") is the

A— application of cross-control pressure.
B— use of too much right rudder control pressure.
C— failure to constantly adjust control pressures for torque and airspeed.

for the amount of bank being used.
B— In a left climbing turn, if insufficient right rudder is applied to compensate for the increased torque effect, a slip will result.
C— In a right descending turn, if excessive left rudder is applied to compensate for the decreased torque effect, a slip will result.

4021. During the full-flare portion of a power-off landing, the rotor RPM tends to

A— increase initially.
B— decrease initially.
C— decrease during high density altitude days, and increase during low density altitude days.

4022. During a climbing turn, the engine RPM is at the desired setting, but the manifold pressure is higher than desired. To maintain the desired engine RPM and correct the manifold pressure, what initial control action should be taken?

A— Decrease the collective pitch only.
B— Decrease the collective pitch and decrease the throttle.
C— Decrease the collective pitch and increase the throttle.

4023. The collective pitch control should be used to

1. correct for loss of lift during level turns at altitude.
2. maintain desired engine power.
3. correct a high rotor RPM during autorotations from altitude.

The correct statement(s) is(are)

A— 1 and 2 only.
B— 1, 2, and 3.
C— 2 only.

4025. At the onset of blade stall vibration, which corrective measures should the pilot take?

A— Reduce collective pitch, increase rotor RPM, and reduce forward airspeed.
B— Reduce collective pitch, decrease rotor RPM, and reduce forward airspeed.
C— Reduce collective pitch, increase rotor RPM, and increase forward airspeed.

4026. What are the major indications of an incipient retreating blade stall situation, in order of occurrence?

A— Low-frequency vibration, pitchup of the nose, and a tendency for the helicopter to roll.
B— High-frequency vibration, pitchdown of the nose, and a tendency for the helicopter to roll.
C— Slow pitchup of the nose, high-frequency vibration, and a tendency for the helicopter to roll.

4027. When operating at high forward airspeed, retreating blade stall is more likely to occur under conditions of

A— high gross weight, high RPM, and smooth air.
B— high gross weight, low RPM, and turbulent air.
C— low gross weight, high RPM, and high density altitude.

4028. If complete power failure occurs while at cruising altitude, the collective pitch should be lowered, as necessary, to

A— uncouple the main rotor system from the engine.
B— engage the freewheeling unit so that proper rotor RPM can be maintained.
C— reduce the pitch on all main rotor blades so that proper rotor RPM can be maintained.

power?

A— While maintaining altitude and a forward airspeed of less than 10 MPH.
B— While maintaining forward cruising airspeed with a rate of descent in excess of 300 feet per minute.
C— While maintaining a forward airspeed of less than 10 MPH with a rate of descent in excess of 300 feet per minute.

4031. Which situation would require the highest power setting to hover?

A— Headed downwind in moderate windspeeds.
B— Headed crosswind in moderate windspeeds.
C— Over tall grass in zero wind conditions.

4032. The antitorque system fails during cruising flight and a powered approach landing is commenced. If the helicopter yaws to the right just prior to touchdown, what could the pilot do to help swing the nose to the left?

A— Increase the throttle.
B— Decrease the throttle.
C— Increase collective pitch.

4033. What corrective action should be taken if the antitorque system should fail while at a hover?

A— Close the throttle and autorotate.
B— Apply left pedal as necessary to stop the torque-induced turn to the right.
C— Lower the collective pitch to reduce the load on the main rotor blades.

A— control taxi speed.
B— maintain heading during crosswind conditions.
C— correct for drift during crosswind conditions.

4036. If excessive right pedal is applied during an autorotative turn to the right, the nose of the helicopter will tend to

A— pitch up and the rotor RPM will tend to increase.
B— pitch down and the rotor RPM will tend to increase.
C— pitch down and the rotor RPM will tend to decrease.

4037. Using right pedal to assist a right turn during an autorotative descent will probably result in what actions?

A— Pitchup of the nose, increase in rotor RPM, decrease in sink rate, and decrease in indicated airspeed.
B— Pitchdown of the nose, increase in the rotor RPM, increase in sink rate, and decrease in indicated airspeed.
C— Pitchdown of the nose, decrease in the rotor RPM, increase in sink rate, and increase in indicated airspeed.

4038. Choose the most correct statement pertaining to slips and skids during helicopter flight.

A— A skid occurs when too much rudder is applied in the direction opposite the turn.
B— A skid occurs when the rate of turn is too slow for the amount of bank being used.
C— In a right descending turn, if insufficient right pedal is applied to compensate for the decreased torque effect, a slip will result.

cyclic pitch control is used primarily to

A— maintain heading.
B— control rate of closure.
C— control angle of descent.

4041. Which statement best describes the function of the controls during a powered approach to hover?

A— Collective pitch primarily controls angle of descent; cyclic pitch primarily controls groundspeed.
B— Cyclic pitch primarily controls angle of descent and groundspeed; collective pitch primarily controls rate of descent.
C— Collective pitch primarily controls angle of descent; rotor RPM primarily controls rate of descent; cyclic pitch primarily controls groundspeed.

4042. When autorotating during high density altitude or strong gusty wind conditions, a slightly higher-than-normal airspeed is recommended because the

A— resulting slower rate of descent will allow more time for the pilot to estimate the touchdown point.
B— resulting glide angle will approximate that of a slightly reduced airspeed under conditions of light loads, low density altitude, or calm wind.
C— lower rotor speed will cause the rate of descent to approximate that of a slightly increased rotor speed under conditions of light loads, low density altitude, or calm wind.

A— Pedals control both heading and direction of movement.
B— Heading is maintained with cyclic; direction of movement (groundpath or track) is maintained with pedals.
C— Heading is maintained with pedals; direction of movement (groundpath or track) is maintained with cyclic.

4045. How should the rotor RPM be controlled during a running landing?

A— Normal operating RPM should be maintained until the helicopter stops, primarily to ensure adequate directional control.
B— The rotor RPM should be permitted to decrease slowly, once the helicopter is on the ground, to allow the full weight of the helicopter to settle on the skids.
C— Normal operating RPM should be maintained during the landing roll or skid, primarily to ensure that sufficient lift is available should an emergency develop.

4046. When making a slope landing, the cyclic pitch control should be used to

A— lower the downslope skid to the ground.
B— hold the upslope skid against the slope.
C— place the rotor disc parallel to the slope.

4047. The steepness of the slope on which a helicopter with skid-type landing gear can land is most dependent on

A— its gross weight.
B— the position of the CG.
C— the amount of lateral cyclic stick travel available.

decelerations (quick stops) is most accurate?

A— The primary purpose of this maneuver is to lose effective translational lift.
B— The rotor RPM will normally tend to increase during the entry and tend to decrease during the completion of the maneuver.
C— The nose of the helicopter will normally tend to yaw to the right during the entry and tend to yaw to the left during the completion of the maneuver.

4050. Dual instruction and solo practice on quick stops should usually be accomplished headed upwind

A— between 100 feet and 200 feet above the surface.
B— and only during low density altitude conditions.
C— at an altitude that will permit a safe clearance between the tail rotor and the ground throughout the maneuver.

4051. During a pinnacle approach to a rooftop heliport under conditions of turbulence and high wind, the pilot should make a

A— shallow approach, maintaining a constant line of descent with cyclic applications.
B— normal approach, maintaining a slower-than-normal rate of descent with cyclic applications.
C— steeper-than-normal approach, maintaining the desired angle of descent with collective applications.

A— Rotor RPM will remain constant during changes in airspeed while descending.
B— A gyroplane is capable of getting into a settling-with-power situation much the same way as a helicopter.
C— A gyroplane can safely descend vertically or move backward with respect to ground references during a descent if altitude permits.

4054. In the event a running landing is performed during crosswind conditions, proper landing technique requires that the

A— longitudinal axis of the gyroplane be parallel to the runway.
B— direction of gyroplane motion and heading coincide with runway direction.
C— lateral axis of the gyroplane be parallel to the gyroplane's direction of motion.

4055. A running or roll-on landing in a gyroplane should be considered

A— an unsafe maneuver if the airspeed is less than 45 MPH.
B— an unsafe maneuver except in calm or light wind conditions.
C— a normal and acceptable maneuver if proper conditions relating to landing surface and groundspeed exist.

4056. Which instrument provides the most pertinent information (primary) for pitch control in straight-and-level flight?

A— Altimeter.
B— Attitude indicator.
C— Airspeed indicator.

A— Turn coordinator and heading indicator.
B— Attitude indicator and turn coordinator.
C— Turn coordinator and attitude indicator.

4059. If an airplane is in an unusual flight attitude and the attitude indicator has exceeded its limits, which instruments should be relied upon to determine pitch attitude before recovery?

A— Airspeed indicator and altimeter.
B— Turn indicator and vertical speed indicator.
C— Vertical speed indicator and airspeed indicator.

4060. Which is the correct sequence for recovery from a spiraling, nose-low, increasing airspeed, unusual flight attitude?

A— Increase pitch attitude, reduce power, and level wings.
B— Reduce power, correct bank attitude, and raise nose to a level attitude.
C— Reduce power, raise nose to a level attitude, and correct bank attitude.

4061. The visual glidepath of a 2-bar VASI provides safe obstruction clearance within plus or minus 10° of the extended runway centerline and to a distance of how many miles from the runway threshold?

A— 4 NM.
B— 6 NM.
C— 10 NM.

4063. When on the glidepath of a standard 2-bar VASI, the far lights should be

A— pink and the near lights should be white.
B— white and the near lights should be red.
C— red and the near lights should be white.

4064. When on the upper glidepath of a 3-bar VASI what would be the colors of the lights?

A— All three sets of lights would be white.
B— The near bar is white and the middle and far bars are red.
C— The near and middle bars are white and the upper bar is red.

4065. An on-glidepath indication from a tri-color VASI is

A— a green light signal.
B— a white light signal.
C— an amber light signal.

4066. An above-glidepath indication from a tri-color VASI is

A— a pink light signal.
B— a white light signal.
C— an amber light signal.

4067. A slightly low indication on a PAPI glidepath is indicated by

A— four red lights.
B— one red light and three white lights.
C— one white light and three red lights.

4068. The last 2,000 feet of runway edge lights on an instrument runway are colored

A— red.
B— white.
C— amber.

A— 5 clicks.
B— 3 clicks.
C— None, the MIRL is left on all night.

4071. A military airfield can be identified by

A— a white and red rotating beacon.
B— white flashing sequence lights (strobes).
C— a green and dual-peaked white rotating beacon.

4072. An unlighted land airport is indicated by a rotating beacon that is colored

A— white.
B— green.
C— white and green.

4073. During the daylight hours, the operation of a rotating beacon at an airport located within a control zone means

A— the control tower is not in operation.
B— right-hand traffic is in use at the airport.
C— weather conditions are below basic VFR weather minimums.

4074. The numbers 8 and 26 on the approach ends of the runway indicate that the runway is orientated approximately

A— 008° and 026° true.
B— 080° and 260° true.
C— 080° and 260° magnetic.

4075. What does a series of arrows painted on the approach end of a runway signify?

A— That area is restricted solely to taxi operations.
B— That portion of the runway is not suitable for landing.
C— That portion of the runway is the designated touchdown zone.

4077. (Refer to figure 54.) What is the difference between area A and area E on the airport?

A— Both areas A and E may be used for taxi and takeoff.
B— Area A may be used for taxi and takeoff; area E may only be used as an overrun.
C— Area A may only be used for taxi; area E may be used for all operations except landings.

4078. When approaching taxiway holding lines from the side with the continuous lines, the pilot

A— may continue taxiing.
B— should not cross the lines without ATC clearance.
C— should continue taxiing until all parts of the aircraft have crossed the lines.

4079. The UNICOM frequency at airports with a control tower is

A— 123.0.
B— 122.95.
C— 122.8.

4080. As standard operating practice, all inbound traffic to an airport without a control tower should continuously monitor the appropriate facility from a distance of

A— 25 miles.
B— 20 miles.
C— 10 miles.

4081. When landing at an airport that does not have a tower, FSS, or UNICOM, you should broadcast your intentions on

A— 122.9 MHz.
B— 123.0 MHz.
C— 123.6 MHz.

A— Only when the ceiling and/or visibility changes by a reportable value.
B— Every 30 minutes if weather conditions are below basic VFR; otherwise, hourly.
C— Upon receipt of any official weather, regardless of content change or reported values.

4084. While flying in a TCA, you receive the following radar traffic advisory:

"TRAFFIC 11 O'CLOCK, 1 MILE, EASTBOUND...."

You should look for this traffic

A— behind the left wingtip.
B— between the nose of the aircraft and the left wingtip.
C— between the nose of the aircraft and the right wingtip.

4085. When an air traffic controller issues radar traffic information in relation to the 12-hour clock, the reference the controller uses is the aircraft's

A— true course.
B— ground track.
C— magnetic heading.

4086. Which action is appropriate if a pilot becomes involved in a hijacking?

A— Transmit code H on 121.5.
B— Set code 7500 on the aircraft transponder.
C— Append the code word PAPA to the aircraft call sign during all radio transmissions.

4087. Which transponder code should the pilot of a civilian aircraft never use?

A— 7500.
B— 7600.
C— 7777.

4089. The recommended entry position to an airport traffic pattern is

A— 45° to the base leg just below traffic pattern altitude.
B— to enter 45° at the midpoint of the downwind leg at traffic pattern altitude.
C— to cross directly over the airport at traffic pattern altitude and join the downwind leg.

4090. (Refer to figure 55.) The segmented circle indicates that the airport traffic pattern is

A— left-hand for Rwy 17 and right-hand for Rwy 35.
B— right-hand for Rwy 35 and right-hand for Rwy 9.
C— left-hand for Rwy 35 and right-hand for Rwy 17.

4091. (Refer to figure 55.) Which runway and traffic pattern should be used as indicated by the wind cone in the segmented circle?

A— Right-hand traffic on Rwy 17.
B— Left-hand traffic on Rwy 27 or Rwy 35.
C— Left-hand traffic on Rwy 35 or right-hand traffic on Rwy 27.

4092. If the control tower wants to instruct a vehicle to proceed, the light gun signal will be

A— steady green.
B— flashing green.
C— flashing white.

4093. To acknowledge light gun signals from the tower at night, the pilot should

A— move the control surfaces.
B— blink landing or navigation lights.
C— S-turn on the ground or roll back and forth in the air.

B— just prior to takeoff.
C— any time the engines are in operation.

4096. When information is disseminated for a navigational facility, it will be located in

A— FDC NOTAMS.
B— NOTAM (L) distribution.
C— NOTAM (D) distribution.

4097. When information is disseminated about a runway closure, it will be located in

A— FDC NOTAMS.
B— NOTAM (L) distribution.
C— NOTAM (D) distribution.

4098. How long will an FSS hold a VFR flight plan past the proposed departure time?

A— 30 minutes.
B— 1 hour.
C— 2 hours.

4099. If an aircraft has a transponder, encoding altimeter, and DME, the proper equipment suffix to be entered on a flight plan is

A— A.
B— R.
C— U.

4100. How much time do you have to close a VFR flight plan before search and rescue procedures are initiated?

A— One hour after your ATA.
B— One-half hour after landing.
C— One-half hour after your ETA.

B— Inward, upward, and counterclockwise.
C— Outward, upward, and around each tip.

4103. What effect would a crosswind of 5 knots or less have on the wingtip vortices generated by a large aircraft that had just taken off?

A— A light crosswind would rapidly dissipate the strength of both vortices.
B— The upwind vortex would tend to remain on the runway longer than the downwind vortex.
C— Both vortices would move downwind at a greater rate than if the surface wind was directly down the landing runway.

4104. During a takeoff made behind a departing large jet airplane, the pilot can minimize the hazard of wingtip vortices by

A— remaining below the jet's flightpath until able to turn clear of its wake.
B— extending the takeoff roll and not rotating until well beyond the jet's rotation point.
C— being airborne prior to reaching the jet's flightpath until able to turn clear of its wake.

4105. When landing behind a large jet aircraft, at which point on the runway should you plan to land?

A— Beyond the jet's touchdown point.
B— At least 1,000 feet beyond the jet's touchdown point.
C— If any crosswind, land on the windward side of the runway and prior to the jet's touchdown point.

4106. Due to the effects of wake turbulence, what minimum separation does ATC provide for a small aircraft landing behind a heavy jet?

A— 4 miles.
B— 5 miles.
C— 6 miles.

A— Alcohol renders a pilot more susceptible to hypoxia.
B— Small amounts of alcohol will not impair flying skills.
C— Coffee helps metabolize alcohol and alleviates a hangover.

4109. If an individual has gone scuba diving which has not required a controlled ascent and will be flying to cabin pressure altitudes of 8,000 feet or less, the recommended waiting time is at least

A— 2 hours.
B— 4 hours.
C— 8 hours.

4110. If an individual has gone scuba diving which has required a controlled ascent and will be flying to cabin pressure altitudes of 8,000 feet or less, the recommended waiting time is at least

A— 8 hours.
B— 12 hours.
C— 24 hours.

4111. After scuba diving and then planning a flight to cabin pressure altitudes above 8,000 feet, an individual should wait at least

A— 12 hours.
B— 18 hours.
C— 24 hours.

4112. Which would most likely result in hyperventilation?

A— Insufficient oxygen.
B— Excessive carbon dioxide.
C— Insufficient carbon dioxide.

B— increasing the breathing rate in order to increase lung ventilation.
C— refraining from the use of over-the-counter remedies and drugs such as antihistamines, cold tablets, tranquilizers, etc.

4115. A rapid acceleration can create the illusion of being in a

A— left turn.
B— noseup attitude.
C— nosedown attitude.

4116. An illusion, that the aircraft is at a higher altitude than it actually is, is produced by

A— atmospheric haze.
B— upsloping terrain.
C— downsloping terrain.

4117. Dark adaptation is impaired by exposure to

A— carbon dioxide.
B— vitamin A in the diet.
C— cabin pressure altitudes above 5,000 feet.

4118. Which procedure is recommended to prevent or overcome spatial disorientation?

A— Avoid steep turns and rough control movements.
B— Rely entirely on the indications of the flight instruments.
C— Reduce head and eye movements to the greatest extent possible.

see traffic or terrain features during flight?

A— Haze causes the eyes to focus at infinity.
B— The eyes tend to overwork in haze and do not detect relative movement easily.
C— All traffic or terrain features appear to be farther away than their actual distance.

4121. Information concerning parachute jumping sites may be found in the

A— NOTAM's.
B— Airport/Facility Directory.
C— Graphic Notices and Supplemental Data.

4122. (Refer to figure 56.) What is the elevation of the DFW VORTAC?

A— 487 feet MSL.
B— 490 feet MSL.
C— 560 feet MSL.

4123. (Refer to figure 56.) On what frequency can a pilot activate the approach lights at Redbird Field when the control tower is not in operation?

A— 120.15.
B— 120.3.
C— 122.95.

4124. (Refer to figure 56.) Select the correct statement concerning Dallas Love Field.

A— Right traffic is in effect for all runways.
B— The runway gradient for Rwy 18 is less than .3 percent.
C— The touchdown zone elevation for Rwy 13R is 53 feet.

security may be symptoms of hypoxia.
C— Forcing oneself to concentrate on the flight instruments will help to overcome the effects of hypoxia.

4127. Which occurs when climbing above 28,000 feet in an unpressurized airplane without supplemental oxygen?

A— Gases trapped in the body contract and prevent nitrogen from escaping the bloodstream.
B— The pressure in the middle ear becomes less than the atmospheric pressure in the cabin.
C— The oxygen pressure within the lungs cannot be maintained without an increase in inhaled oxygen pressure.

4128. Hypoxia is the result of

A— shortage of oxygen in the body.
B— insufficient oxygen in the air.
C— excessive nitrogen in the bloodstream.

4129. One aid in increasing night vision effectiveness would be to

A— look directly at objects.
B— force the eyes to view off center.
C— increase intensity of interior lighting.

4130. What suggestion could you make to students who are experiencing motion sickness?

A— Recommend taking medication to prevent motion sickness.
B— Have the students lower their head, shut their eyes, and take deep breaths.
C— Tell the students to avoid unnecessary head movement and to keep their eyes on a point outside the aircraft.

to ensure safe flight. Select the instructing technique that is recommended to help a student develop this skill.

A— Use of distractions during training flight.
B— Scheduling the student with several different instructors during flight training.
C— Demonstrating each new maneuver several times before permitting student practice.

4133. During training flights, an instructor should interject distractions to determine if the student can

A— be easily discouraged.
B— learn despite stressful conditions.
C— maintain aircraft control while his/her attention is diverted.

4134. During S-turn practice, an acceptable example of interjecting a distracting situation is to request the student to

A— fly at minimum controllable airspeed.
B— change airspeed during course reversal.
C— identify certain objects on the ground.

4135. What is an effective way to prevent a collision hazard in the traffic pattern?

A— Enter the pattern in a descent.
B— Maintain the proper traffic pattern altitude and continually scan the area.
C— Rely on radio reports from other aircraft who may be operating in the traffic pattern.

A— hazy days.
B— clear days.
C— cloudy nights.

4138. What consideration should be given in the choice of a towplane for use in aerotows?

A— Stall speed of the towplane.
B— Gross weight of the glider to be towed.
C— Towplane's low-wing loading and low-power loading.

4139. The reason for retaining water ballast while thermals are strong and dumping the water when thermals weaken is to

A— decrease forward speed.
B— increase forward speed.
C— decrease the rate of descent.

4140. What is the proper speed to fly when passing through lift with no intention to work the lift?

A— Best lift/drag speed.
B— Minimum sink speed.
C— Maximum safe speed.

4141. When flying into a strong headwind on a long glide back to the airport, the recommended speed to use is the

A— best glide speed.
B— minimum sink speed.
C— best lift/drag speed plus half the estimated windspeed at the glider's flight altitude.

A— 10° at 50 feet, 20° at 100 feet, and 45° at 200 feet.
B— 15° at 50 feet, 20° at 100 feet, and 40° at 200 feet.
C— 15° at 50 feet, 30° at 100 feet, and 45° at 200 feet.

4144. At what point during an auto tow should the glider pilot establish the maximum pitch attitude for the climb?

A— 200 feet above the ground.
B— 100 feet above the ground.
C— Between 300 and 400 feet above the ground.

4145. Unless adequate speed control is maintained during the turn to base and the final approach for a landing into the wind, which would most likely occur if a steep wind gradient existed?

A— The desired landing spot would be undershot or the glider would stall.
B— The airspeed on final approach would increase, causing the glider to overshoot the desired landing spot.
C— The wingtip on the outside of the turn would stall before the wingtip on the inside of the turn.

4146. If swirling dust, leaves, or debris indicate a strong thermal on the final approach to a landing, it is recommended that the glider pilot

A— open the spoilers and reduce the airspeed.
B— close the spoilers and increase the airspeed.
C— open the spoilers and maintain a constant airspeed.

A— All reversing turns should be made to the left.
B— All turns should be made downwind toward the slope.
C— All reversing turns should be made into the wind away from the slope.

A— Landing into the wind, regardless of the type or slope of the terrain.
B— Landing in a pasture or noncultivated field rather than one in cultivation and whose crops have been harvested.
C— Maintaining an approach airspeed of at least 50 percent above the glider's stall speed plus half the estimated windspeed.

APPENDIX 1

of test items missed may differ from the number of subject matter codes shown on the AC Form 8080-2, since you may have missed more than one question in a certain subject matter code.

FAR 1	**Definitions and Abbreviations**
A01	General Definitions
A02	Abbreviations and Symbols
FAR 23	**Airworthiness Standards: Normal, Utility, and Acrobatic Category Aircraft**
A10	General
FAR 25	**Airworthiness Standards: Transport Category Airplanes**
A03	General
A04	Flight
A05	Structure
A06	Design and Construction
A07	Powerplant
A08	Equipment
A09	Operating Limitations and Information
FAR 43	**Maintenance, Preventive Maintenance, Rebuilding, and Alteration**
A15	General
A16	Appendixes
FAR 61	**Certification: Pilots and Flight Instructors**
A20	General
A21	Aircraft Ratings and Special Certificates
A22	Student Pilots
A23	Private Pilots
A24	Commercial Pilots
A25	Airline Transport Pilots
A26	Flight Instructors
A27	Appendix A: Practical Test Requirements for Airline Transport Pilot Certificates and Associated Class and Type Ratings
A28	Appendix B: Practical Test Requirements for Rotorcraft Airline Transport Pilot Certificates with a Helicopter Class Rating and Associated Type Ratings
A29	Recreational Pilot
FAR 63	**Certification: Flight Crewmembers Other Than Pilots**
A30	General
A31	Flight Engineers
A32	Flight Navigators
FAR 65	**Certification: Airmen Other Than Flight Crewmembers**
A40	General
A41	Aircraft Dispatchers
FAR 71	**Designation of Federal Airways, Area Low Routes, Controlled Airspace, and Reporting Points**
A60	General
A61	Airport Radar Service Areas
A64	Control Areas and Extensions

B13	Maintenance, Preventive Maintenance, and Alterations
B14	Large and Turbine-powered Multiengine Airplanes
B15	Additional Equipment and Operating Requirements for Large and Transport Category Aircraft
B16	Appendix A - Category II Operations: Manual, Instruments, Equipment, and Maintenance
FAR 97	**Standard Instrument Approach Procedures**
B97	General
FAR 108	**Airplane Operator Security**
C10	General
FAR 121	**Certification and Operations: Domestic, Flag and Supplemental Air Carriers and Commercial Operators of Large Aircraft**
D01	General
D02	Certification Rules for Domestic and Flag Air Carriers
D03	Certification Rules for Supplemental Air Carriers and Commercial Operators
D04	Rules Governing all Certificate Holders Under This Part
D05	Approval of Routes: Domestic and Flag Air Carriers
D06	Approval of Areas and Routes for Supplemental Air Carriers and Commercial Operators
D07	Manual Requirements
D16	Aircraft Dispatcher Qualifications and Duty Time Limitations: Domestic and Flag Air Carriers
D17	Flight Time Limitations and Rest Requirements: Domestic Air Carriers
D18	Flight Time Limitations: Flag Air Carriers
D19	Flight Time Limitations: Supplemental Air Carriers and Commercial Operators
D20	Flight Operations
D21	Dispatching and Flight Release Rules
D22	Records and Reports
D23	Crewmember Certificate: International
D24	Special Federal Aviation Regulation SFAR No. 14
FAR 125	**Certification and Operations: Airplanes Having a Seating Capacity of 20 or More Passengers or a Maximum Payload Capacity of 6,000 Pounds or More**
D30	General
D31	Certification Rules and Miscellaneous Requirements
D32	Manual Requirements
D33	Airplane Requirements
D34	Special Airworthiness Requirements
D35	Instrument and Equipment Requirements
D36	Maintenance
D37	Airman and Crewmember Requirements
D38	Flight Crewmember Requirements
D39	Flight Operations
D40	Flight Release Rules
D41	Records and Reports

E05	Flight Crewmember Requirements
E06	Flight Crewmember Flight Time Limitations and Rest Requirements
E07	Crewmember Testing Requirements
E08	Training
E09	Airplane Performance Operating Limitations
E10	Maintenance, Preventive Maintenance, and Alterations
E11	Appendix A: Additional Airworthiness Standards for 10 or More Passenger Airplanes
E12	Special Federal Aviation Regulations SFAR No. 36
E13	Special Federal Aviation Regulations SFAR No. 38

US HMR 172 Hazardous Materials Table

F02	General

US HMR 175 Materials Transportation Bureau Hazardous Materials Regulations (HMR)

G01	General Information and Regulations
G02	Loading, Unloading, and Handling
G03	Specific Regulation Applicable According to Classification of Material

NTSB 830 Rules Pertaining to the Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records

G10	General
G11	Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft

H01	Principles of Flight
H02	Airplanes and Engines
H03	Flight Instruments
H04	Airplane Performance
H05	Weather
H06	Basic Calculations Using Navigational Computers or Electronic Calculators
H07	Navigation
H09	Appendix 1: Obtaining FAA Publications

AC 91-23 Pilot's Weight and Balance Handbook

H10	Weight and Balance Control
H11	Terms and Definitions
H12	Empty Weight Center of Gravity
H13	Index and Graphic Limits
H14	Change of Weight
H15	Control of Loading — General Aviation
H16	Control of Loading — Large Aircraft

AC 60-14 Aviation Instructor's Handbook

H20	The Learning Process
H21	Human Behavior
H22	Effective Communication
H23	The Teaching Process
H24	Teaching Methods
H25	The Instructor as a Critic
H26	Evaluation
H27	Instructional Aids
H30	Flight Instructor Characteristics and Responsibilities
H31	Techniques of Flight Instruction
H32	Planning Instructional Activity

H56	Airport Traffic Patterns and Operations
H57	Takeoffs and Departure Climbs
H58	Landing Approaches and Landings
H59	Faulty Approaches and Landings
H60	Proficiency Flight Maneuvers
H61	Cross-Country Flying
H62	Emergency Flight by Reference to Instruments
H63	Night Flying
H64	Seaplane Operations
H65	Transition to Other Airplanes
H66	Principles of Flight and Performance Characteristics

AC 61-13 Basic Helicopter Handbook

H70	General Aerodynamics
H71	Aerodynamics of Flight
H72	Loads and Load Factors
H73	Function of the Controls
H74	Other Helicopter Components and Their Functions
H75	Introduction to the Helicopter Flight Manual
H76	Weight and Balance
H77	Helicopter Performance
H78	Some Hazards of Helicopter Flight
H79	Precautionary Measures and Critical Conditions
H80	Helicopter Flight Maneuvers
H81	Confined Area, Pinnacle, and Ridgeline Operations
H82	Glossary

AC 61-27 Instrument Flying Handbook

I01	Training Considerations
I02	Instrument Flying: Coping with Illusions in Flight
I03	Aerodynamic Factors Related to Instrument Flying
I04	Basic Flight Instruments
I05	Attitude Instrument Flying — Airplanes
I06	Attitude Instrument Flying — Helicopters
I07	Electronic Aids to Instrument Flying
I08	Using the Navigation Instruments
I09	Radio Communications Facilities and Equipment
I10	The Federal Airways System and Controlled Airspace
I11	Air Traffic Control
I12	ATC Operations and Procedures
I13	Flight Planning
I14	Appendix: Instrument Instructor Lesson Guide — Airplanes
I15	Segment of En Route Low Altitude Chart

AC 00-6 Aviation Weather

I20	The Earth's Atmosphere
I21	Temperature
I22	Atmospheric Pressure and Altimetry
I23	Wind
I24	Moisture, Cloud Formation, and Precipitation
I25	Stable and Unstable Air
I26	Clouds
I27	Air Masses and Fronts
I28	Turbulence
I29	Icing
I30	Thunderstorms
I31	Common IFR Producers
I32	High Altitude Weather
I33	Arctic Weather

I42	Pilot and Radar Reports and Satellite Pictures
I43	Aviation Weather Forecasts
I44	Surface Analysis Chart
I45	Weather Depiction Chart
I46	Radar Summary Chart
I47	Significant Weather Prognostics
I48	Winds and Temperatures Aloft
I49	Composite Moisture Stability Chart
I50	Severe Weather Outlook Chart
I51	Constant Pressure Charts
I52	Tropopause Data Chart
I53	Tables and Conversion Graphs

AIM **Airman's Information Manual**

J01	Air Navigation Radio Aids
J02	Radar Services and Procedures
J03	Airport Lighting Aids
J04	Air Navigation and Obstruction Lighting
J05	Airport Marking Aids
J06	Airspace — General
J07	Uncontrolled Airspace
J08	Controlled Airspace
J09	Special Use Airspace
J10	Other Airspace Areas
J11	Service Available to Pilots
J12	Radio Communications Phraseology and Techniques
J13	Airport Operations
J14	ATC Clearance/Separations
J15	Preflight
J16	Departure Procedures
J17	En Route Procedures
J18	Arrival Procedures
J19	Pilot/Controller Roles and Responsibilities
J20	National Security and Interception Procedures
J29	Potential Flight Hazards
J30	Safety, Accident, and Hazard Reports
J31	Fitness for Flight
J32	Type of Charts Available
J33	Pilot Controller Glossary
J34	Airport/Facility Directory
J35	En Route Low Altitude Chart
J36	En Route High Altitude Chart
J37	Sectional Chart
J40	Standard Instrument Departure (SID) Chart
J41	Standard Terminal Arrival (STAR) Chart
J42	Instrument Approach Procedures
J43	Helicopter Route Chart

AC 67-2 **Medical Handbook for Pilots**

J52	Hypoxia
J53	Hyperventilation
J55	The Ears
J56	Alcohol
J57	Drugs and Flying
J58	Carbon Monoxide
J59	Vision
J60	Night Flight
J61	Cockpit Lighting
J62	Disorientation (Vertigo)
J63	Motion Sickness
J64	Fatigue
J65	Noise
J66	Age
J67	Some Psychological Aspects of Flying
J68	The Flying Passenger

K11	AC 20-34D, Prevention of Retractable Landing Gear Failure
K12	AC 20-32, Carbon Monoxide (CO) Contamination in Aircraft — Detection and Prevention
K13	AC 20-43, Aircraft Fuel Control
K20	AC 20-103, Aircraft Engine Crankshaft Failure
L10	AC 61-92, Use of Distractions During Pilot Certification Flight Tests
L34	AC 90-48, Pilots' Role in Collision Avoidance
L42	AC 90-87, Helicopter Dynamic Rollover
L50	AC 91-6, Water, Slush, and Snow on the Runway
L51	AC 91-8, Use of Oxygen by Aviation Pilots/Passengers
L52	AC 91-13, Cold Weather Operation of Aircraft
L53	AC 91-14, Altimeter Setting Sources
L57	AC 91-43, Unreliable Airspeed Indications
L59	AC 91-46, Gyroscopic Instruments — Good Operating Practices
L61	AC 91-50, Importance of Transponder Operation and Altitude Reporting
L62	AC 91-51, Airplane Deice and Anti-Ice Systems
L80	AC 103-4, Hazard Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft (This AC is not listed as a current document
M01	AC 120-12, Private Carriage Versus Common Carriage of Persons or Property
M02	AC 120-27, Aircraft Weight and Balance Control

America

N01	A History of American Soaring
N02	Training
N03	Ground Launch
N04	Airplane Tow
N05	Meteorology
N06	Cross-Country and Wave Soaring
N07	Instruments and Oxygen
N08	Radio, Rope, and Wire
N09	Aerodynamics
N10	Maintenance and Repair

Soaring Flight Manual — Jeppesen-Sanderson, Inc.

N20	Sailplane Aerodynamics
N21	Performance Considerations
N22	Flight Instruments
N23	Weather for Soaring
N24	Medical Factors
N25	Flight Publications and Airspace
N26	Aeronautical Charts and Navigation
N27	Computations for Soaring
N28	Personal Equipment
N29	Preflight and Ground Operations
N30	Aerotow Launch Procedures
N31	Ground Launch Procedures
N32	Basic Flight Maneuvers and Traffic
N33	Soaring Techniques
N34	Cross-Country Soaring

Taming The Gentle Giant — Taylor Publishing

O01	Design and Construction of Balloons
O02	Fuel Source and Supply
O03	Weight and Temperature

O11	Human Behavior and Pilot Proficiency
O12	The Flight Check and the Designated Examiner

Balloon Federation of America — Propane Systems

O20	Propane Glossary
O21	Chemical and Physical Systems
O22	Cylinders
O23	Lines and Fittings
O24	Valves
O25	Regulators
O26	Burners
O27	Propane Systems — Schematics
O28	Propane References

Balloon Federation of America — Powerline Excerpts

O30	Excerpts

Goodyear Airship Operations Manual

P01	Buoyancy
P02	Aerodynamics
P03	Free Ballooning
P04	Aerostatics
P05	Envelope
P06	Car
P07	Powerplant
P08	Airship Ground Handling
P09	Operating Instructions
P10	History

Aerodynamics For Naval Aviators, NAVWEPS 00-80T-80

R01	Wing and Airfoil Forces
R02	Planform Effects and Airplane Drag
R33	Directional Stability and Control
R34	Lateral Stability and Control
R35	Miscellaneous Stability Problems
R40	General Definitions and Structural Requirements
R41	Aircraft Loads and Operating Limitations
R50	Application of Aerodynamics to Specific Problems of Flying

AC 65-9A Airframe and Powerplant Mechanics General Handbook

S01	Mathematics
S02	Aircraft Drawings
S03	Aircraft Weight and Balance
S04	Fuels and Fuel Systems
S05	Fluid Lines and Fittings
S06	Aircraft Hardware, Materials, and Processes
S07	Physics
S08	Basic Electricity
S09	Aircraft Generators and Motors
S10	Inspection Fundamentals
S11	Ground Handling, Safety, and Support Equipment

AC 65-12A Airframe and Powerplant Mechanics Powerplant Handbook

S12	Theory and Construction of Aircraft Engines
S13	Induction and Exhaust Systems
S14	Engine Fuel and Metering Systems
S15	Engine Ignition and Electrical Systems
S16	Engine Starting Systems
S17	Lubrication and Cooling Systems
S18	Propellers
S19	Engine Fire Protection Systems
S20	Engine Maintenance and Operation

S26	Landing Gear Systems
S27	Fire Protection Systems
S28	Aircraft Electrical Systems
S29	Aircraft Instrument Systems
S30	Communications and Navigation Systems
S31	Cabin Atmosphere Control Systems

EA-ITP-GB **Aviation Technician Integrated Training Program General Section Textbook — International Aviation Publishers (IAP), Inc.**

S32	Mathematics and Physics
S33	Basic Electricity - DC
S34	Basic Electricity - AC
S35	Aircraft Drawings
S36	Weight and Balance
S37	Fluid Lines and Fittings
S38	Aircraft Hardware
S39	Aircraft Structure Materials
S40	Corrosion and Its Control
S41	Ground Handling and Servicing
S42	Maintenance Publications
S43	Federal Aviation Regulations
S44	Maintenance Forms and Records

EA-ITP-P **Aviation Technician Integrated Training Program Powerplant Section Textbook — IAP, Inc.**

S45	Reciprocating Engine Theory
S46	Reciprocating Engine Maintenance and Operation
S47	Turbine Engine Theory
S48	Turbine Engine Maintenance and Operation
S49	Engine Ignition Systems
S58	Engine Starting Systems
S59	Engine Lubrication Systems
S60	Propellers

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W09	Prop Aircraft Applied Performance
W10	Helicopter Aerodynamics
W11	Hazards of Low Speed Flight
W12	Takeoff Performance
W13	Landing Performance
W14	Maneuvering Performance
W15	Longitudinal Stability and Control

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APPENDIX 2

B _____
- USE OF GROUND REFERENCES TO CONTROL PATH.
- OBSERVATION AND CONTROL OF WIND EFFECT.
- CONTROL OF AIRPLANE ATTITUDE, ALTITUDE, AND HEADING.

C _____
- PREFLIGHT DISCUSSION. : 10
- INSTRUCTOR DEMONSTRATIONS. : 25
- STUDENT PRACTICE. : 45
- POSTFLIGHT CRITIQUE. : 10

D _____
- CHALKBOARD FOR PREFLIGHT DISCUSSION.
- IFR VISOR FOR MANEUVERS REVIEWED.

E _____
- PREFLIGHT – DISCUSS LESSON OBJECTIVE. DIAGRAM RECTANGULAR COURSE, S-TURNS ACROSS A ROAD, AND TURNS AROUND A POINT ON CHALKBOARD.
- INFLIGHT – DEMONSTRATE ELEMENTS. DEMONSTRATE RECTANGULAR COURSE, S-TURNS ACROSS A ROAD, AND TURNS AROUND A POINT. COACH STUDENT PRACTICE.
- POSTFLIGHT – CRITIQUE STUDENT PERFORMANCE AND MAKE STUDY ASSIGNMENT.

F _____
- PREFLIGHT – DISCUSS LESSON OBJECTIVE AND RESOLVE QUESTIONS.
- INFLIGHT – REVIEW PREVIOUS MANEUVERS INCLUDING POWER-OFF STALLS AND SLOW FLIGHT. PERFORM EACH NEW MANEUVER AS DIRECTED.
- POSTFLIGHT – ASK PERTINENT QUESTIONS.

G _____
- STUDENT SHOULD DEMONSTRATE COMPETENCY IN MAINTAINING ORIENTATION, AIRSPEED WITHIN 10 KNOTS, ALTITUDE WITHIN 100 FEET, AND HEADINGS WITHIN 10 DEGREES, AND IN MAKING PROPER CORRECTION FOR WIND DRIFT.

FIGURE 1.—Lesson Plan.

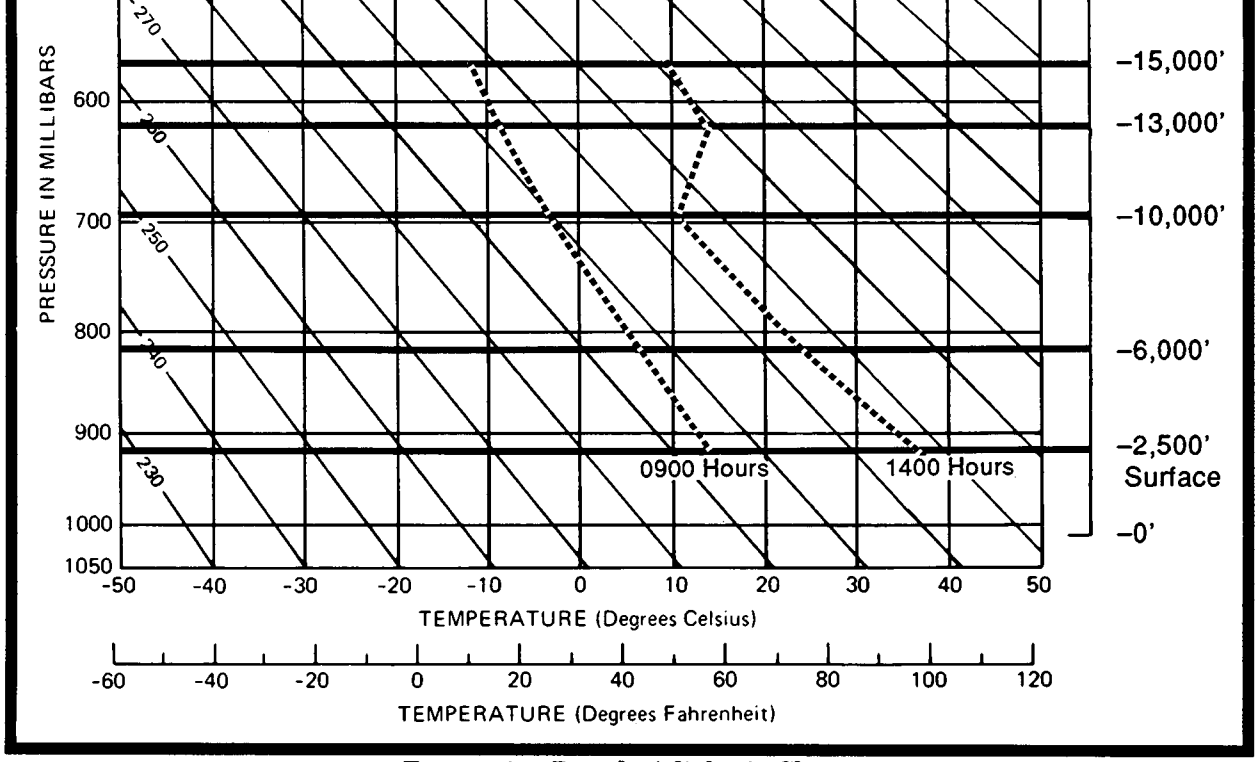


FIGURE 2.—Pseudo-Adiabatic Chart.

BRO SA 1655 20 SCT 130 SCT E250 OVC 7 149/85/67/1515G20/997/RB19E25
TCU ALQDS

FIGURE 3.—Surface Aviation Weather Reports.

PILOT REPORTS

UA /OV DAL 090015 1725 FL090 /TP BE55 /SK 045 OVC 085 CLR ABV
UA /OV ABI 270015 1845 FL120 /TP C411 /TB MDT BLO–100
UA /OV AUS 315020 1715 FL150 /TP C500 /SK OVC 130 /IC TRACE RIME
DURGC WBND 090–130
UA /OV BRO 360030 1700 FL045 /TP PA31 /SK 050 OVC /RM LRG TSTM
50N BRO 20 WIDE

FIGURE 4.—Pilot Reports.

SELECTED TERMINAL FORECASTS

FT 300940
ABI 301010 C250 BKN 1413. 12Z 20 SCT C100 BKN 1615 CHC C14 OVC 1TRW. 18Z 30 SCT
C100 BKN 1716 CHC C10 OVC 1TRW. 02Z 80 SCT C250 BKN 04Z VFR . .

ACT 301010 C1 X 1/2F VRBL C7 BKN 3F. 17Z C20 BKN CHC C12 OVC 2TRW. 04Z VFR CIG
ABV 10 THSD BCMG IFR CIG TRWF . .

AMA 301010 C8 OVC 3R–F 0314 CHC C5 OVC 1TRW–F. 17Z C18 BKN 0418 CHC C8 OVC 1 TRWF.
20Z C30 BKN 1417 CHC C10 OVC 1TRW+F. 04Z MVFR CIG . .

AUS 301010 C5 OVC 2F. 14Z C14 OVC 1510 CHC TRW. 20Z C20 OVC 1510 CHC C5 OVC 2TRW
G25. 02Z C12 OVC 1010 CHC TRW. 04Z MVFR CIG TRW . .

BRO 301010 40 SCT C150 OVC 1210. 14Z C30 BKN 1512 CHC RW/TRW. 02Z C12 OVC 1010
CHC RW/TRW. 04Z MVFR CIG TRW . .

DAL 301010 80 SCT C250 4F VRBL C4 OVC 1F. 16Z C18 BKN 0512 SLGT CHC C12 OVC 2TRWF.
19Z 30 SCT C80 BKN 0612 SCT CHC C10 OVC 1TRWF. 04Z VFR . .

FIGURE 5.—Terminal Forecasts.

.
OK
CIGS 10–15 OVC LYRD TO 120. OCNL CIGS BLO 10 OVC AND VSBYS BLO 3R–S–F. 19Z CIGS 20 BKN–OVC 80 BKN 120. 22Z AGL 20–30 SCT–BKN 60. OTLK...VFR.

.
NWRN TX
CIGS 20–30 BKN 80. OCNL CIGS BLO 10 TIL 16Z ERN PNHDL.
18Z AGL 30–50 SCT. OTLK...VFR.

.
SWRN TX
NO CIGS BLO 120. OTLK...VFR.

.
NCNTRL AND NERN TX
AGL 15–20 SCT–BKN 50 BKN–OVC 120. ISOLD RW–. 18Z AGL 20–30 SCT 80 BKN 120. OTLK...VFR.

.
SCNTRL TX SERN TX AND CSTL WTRS
CSTL PLAIN SERN AND CSTL WTRS..CIGS 15–20 BKN–OVC 40 OVC 15. SCT TRW WITH CB TOPS 450 EXTRM SERN AND CSTL WTRS TIL 15Z. 16Z CIGS 30 BKN–SCT 80 BKN 120. OTLK...VFR.
RMNDR SCNTRL TX...CIGS 30–50 BKN 80 BKN 121. 16Z 80 BKN 120. OTLK...VFR.

.
AR LA AND CSTL WTRS
CIGS 10–15 OVC LYJD TO 180. OCNL CIGS BLO 10 OVC AND VSBYS BLO 3R–F. SCT TRW WITH CB TOPS 450 SLOLY ENDG FROM W. 18Z CIGS 20 BKN 60 BKN–OVC 120. ISOLD TRW– WITH CB TOPS 350 SERN LA. 21Z AGL 30–50 SCT 80 BKN 120 LA AND CIGS 20–30 BKN–SCT 80 BKN 120 AR. OTLK...VFR.

.
WRN TWO THIRDS TN MS AND CSTL WTRS
CIGS 10–15 OVC LYRD TO 150. OCNL CIGS BLO 10 OVC AND VSBYS BLO 3R–F. SCT TRW WITH CB TOPS 450. OTLK...MVFR CIG RW.

.
ERN THIRD IN
AGL 20 SCT 30–50 BKN–OVC LYRD TO 120. 15Z CIGS 20–30 BKN 50 OVC LYRD TO 150. WDLY SCT TRW WITH CB TOPS 450. OTLK...MVFR CIG TRW.

.
AL
NWRN HALF...CIGS 10 OVC LYRD TO 150. WDLY SCT RW– WITH OCNL CIGS BLO 10 OVC AND VSBYS BLO 3R–F TIL 17Z. WDLY SCT TRW WITH CB TOPS 450 AFT 13Z. OTLK...MVFR CIG TRW.
SERN HALF AND CSTL WTRS...CIGS 15–20 BKN–OVC LYRD TO 150 WITH WDLY SCT RW– SWRN PIN. LCL CIGS BLO 10 OVC AND VSBYS BLO 3R–F TIL 16Z. WDLY SCT TRW– WITH CB TOPS 450 AFT 16Z. OTLK...MVFR CIG TRW.
...

FIGURE 6.—Area Forecast.

ABQ			1307+08	1608+01	2005–13	2508–26	271642	282151	292460
AMA		0408	0905+05	9900+00	2108–13	2214–25	232141	232351	232261
BRO	9900	2211+14	2314+09	2318+04	2428–10	2336–23	234739	235448	246358
DAL	1008	1506+11	1705+07	2006+01	2210–13	2217–24	222740	223049	232960
ICT	3514	3412+06	3210+03	2910–01	2618–13	2526–26	253542	254052	254463

FIGURE 7.—Winds and Temperatures Aloft Forecasts.

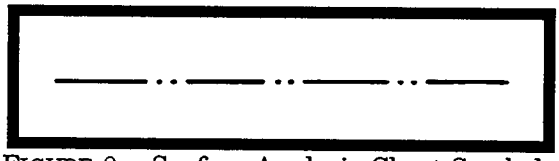


FIGURE 8.—Surface Analysis Chart Symbol.

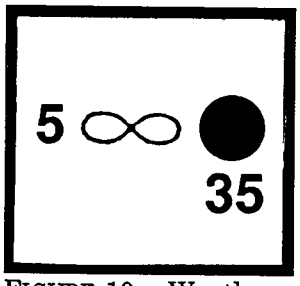


FIGURE 10.—Weather Depiction Chart Symbol.

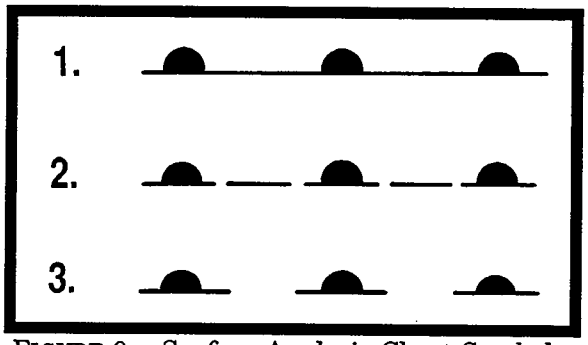


FIGURE 9.—Surface Analysis Chart Symbols.

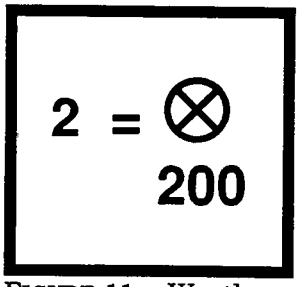


FIGURE 11.—Weather Depiction Chart Symbol.

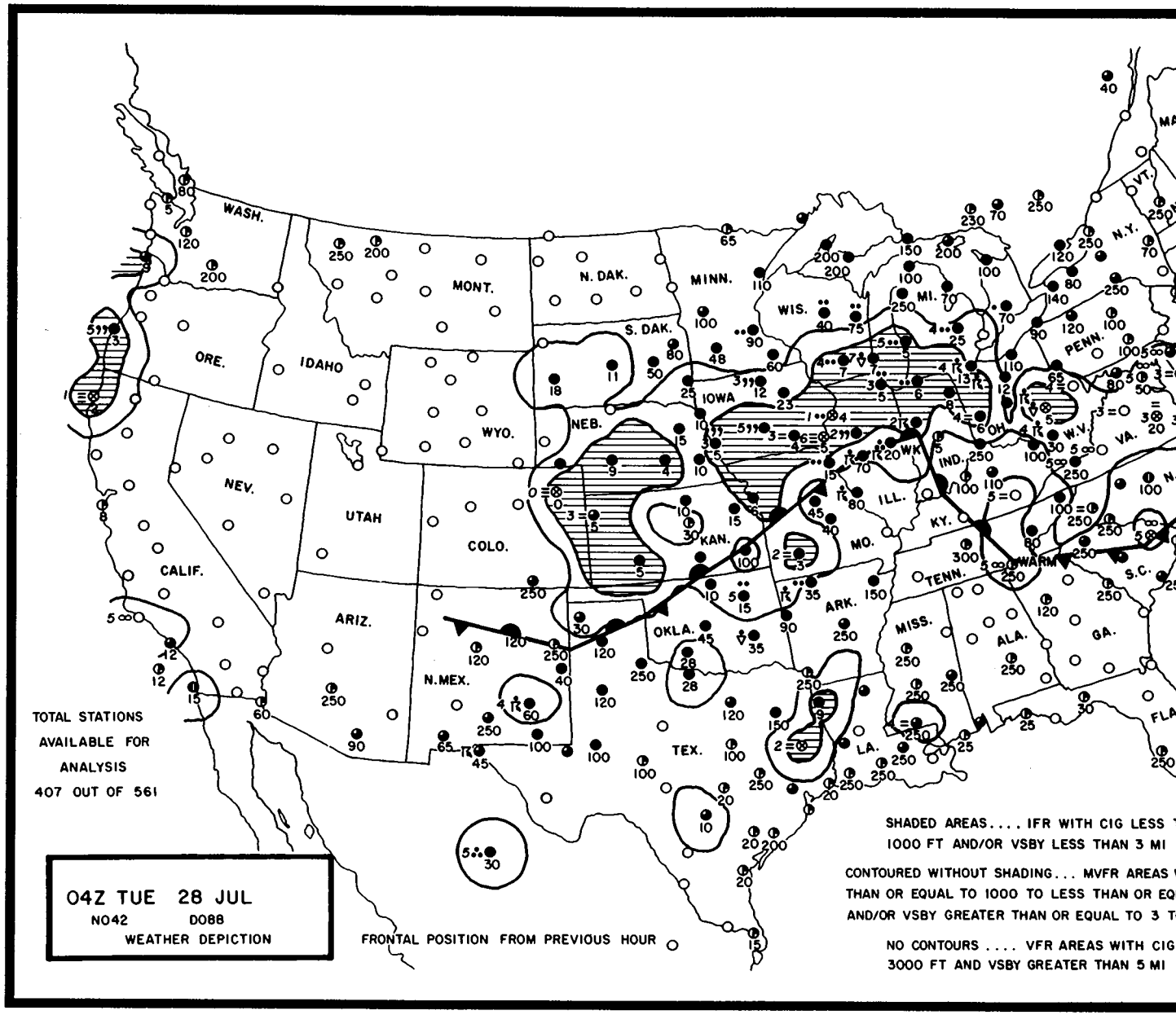


FIGURE 12.—Weather Depiction Chart.

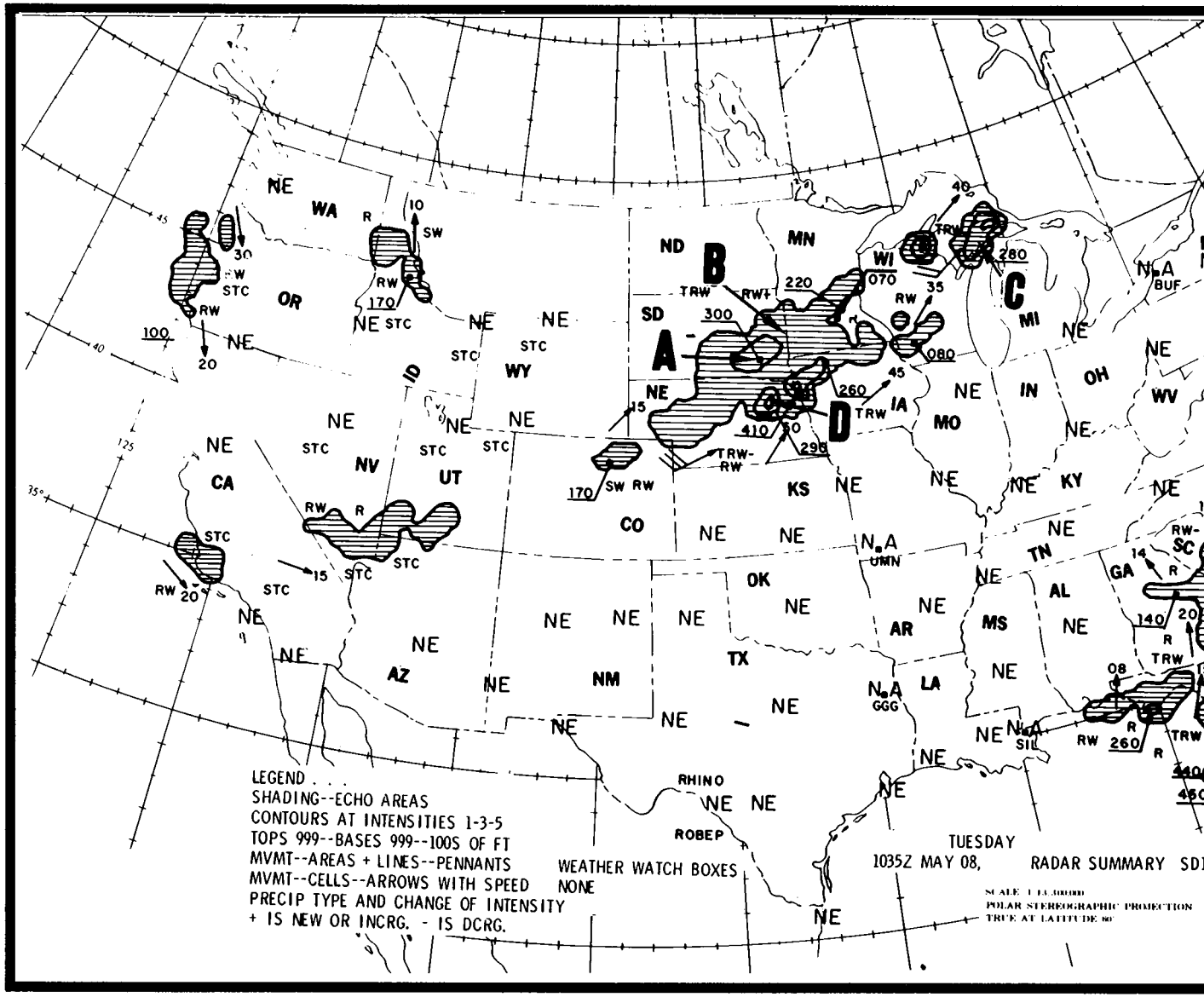


FIGURE 13.—Radar Summary Chart.

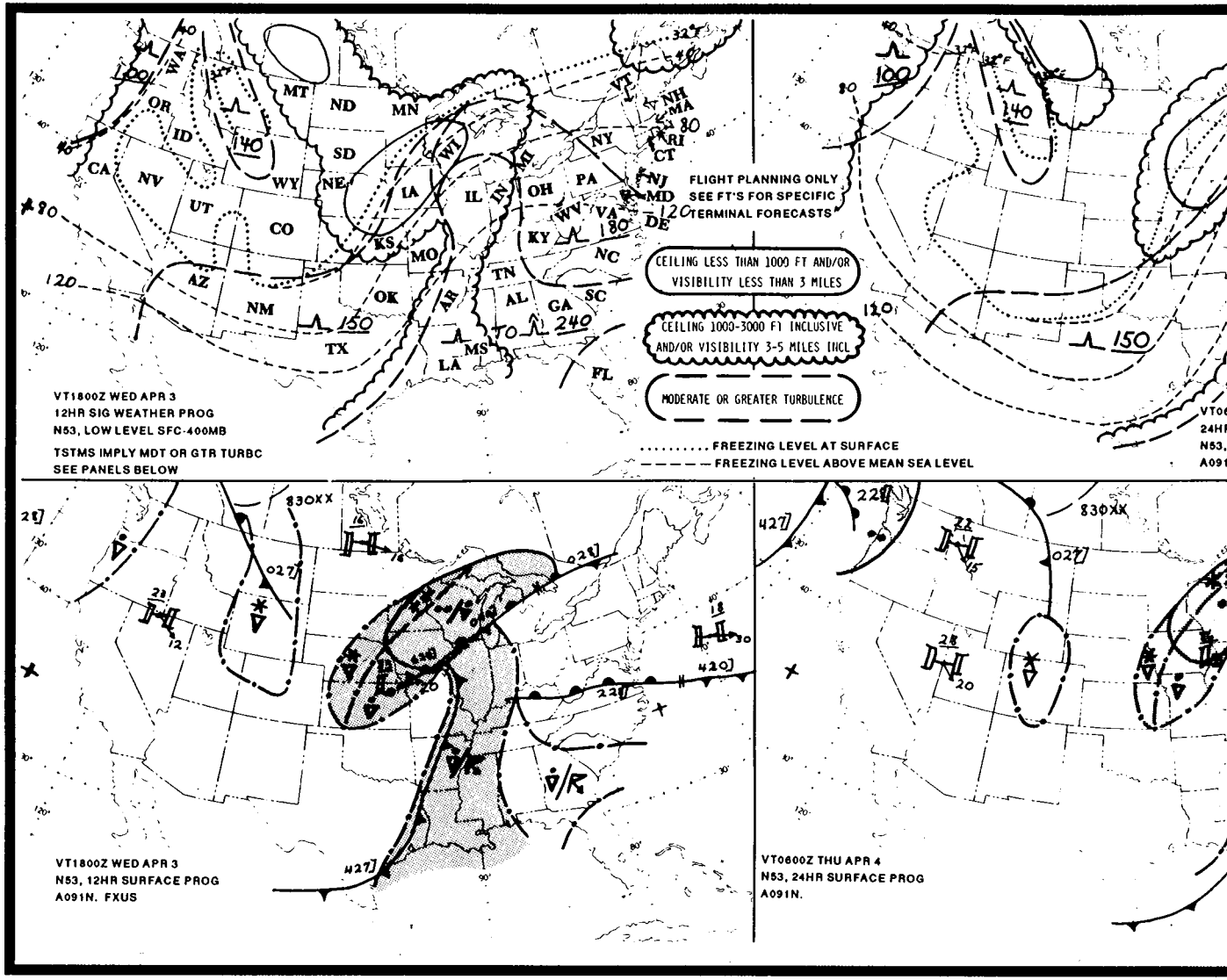


FIGURE 14.—Significant Weather Prognostic Chart.

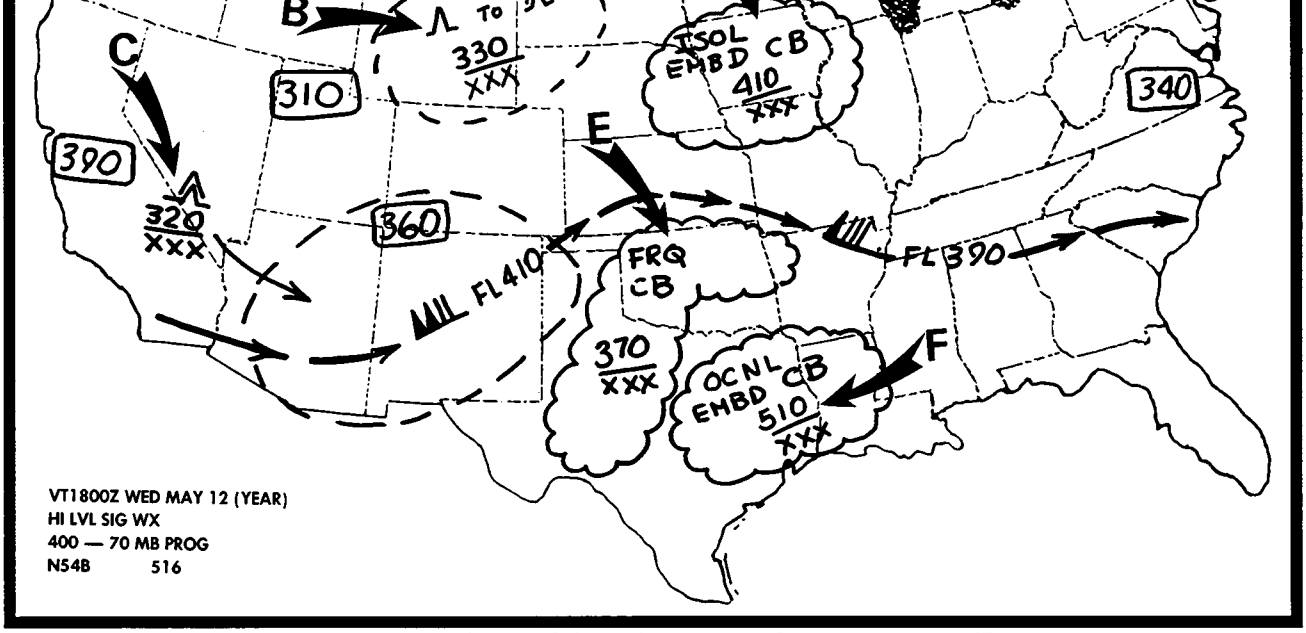
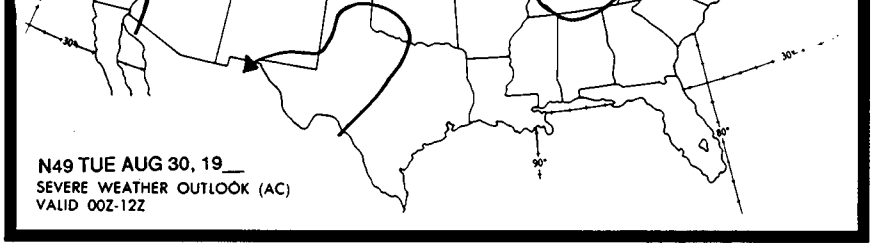


FIGURE 15.—High-Level Significant Weather Prognostic Chart.



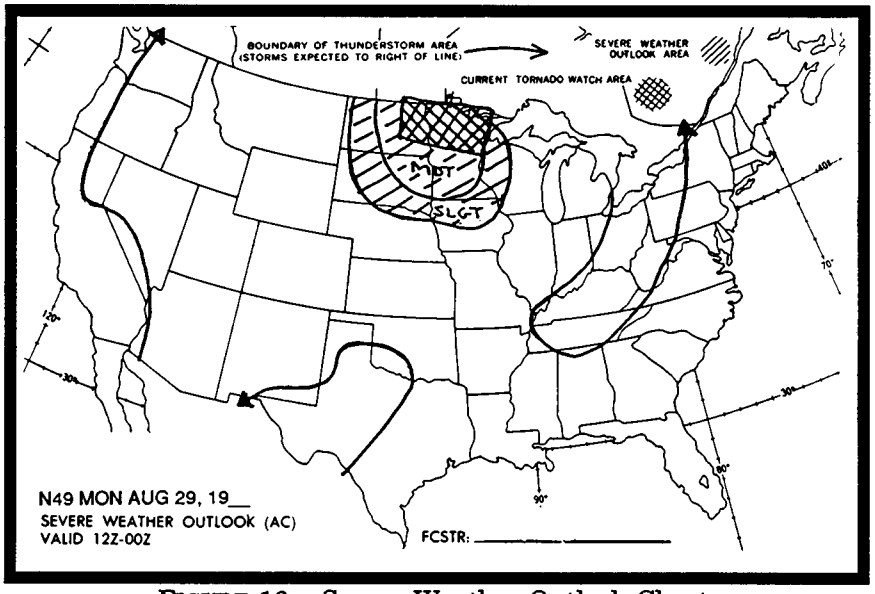


FIGURE 16.—Severe Weather Outlook Chart.

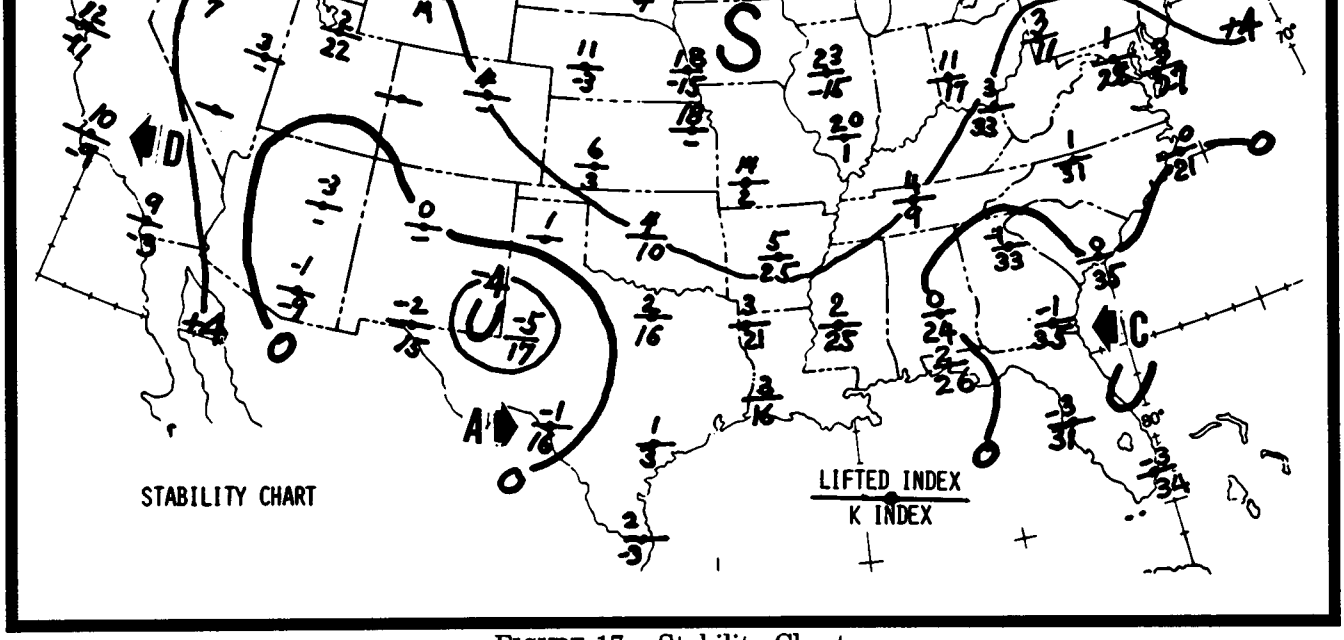


FIGURE 17.—Stability Chart.

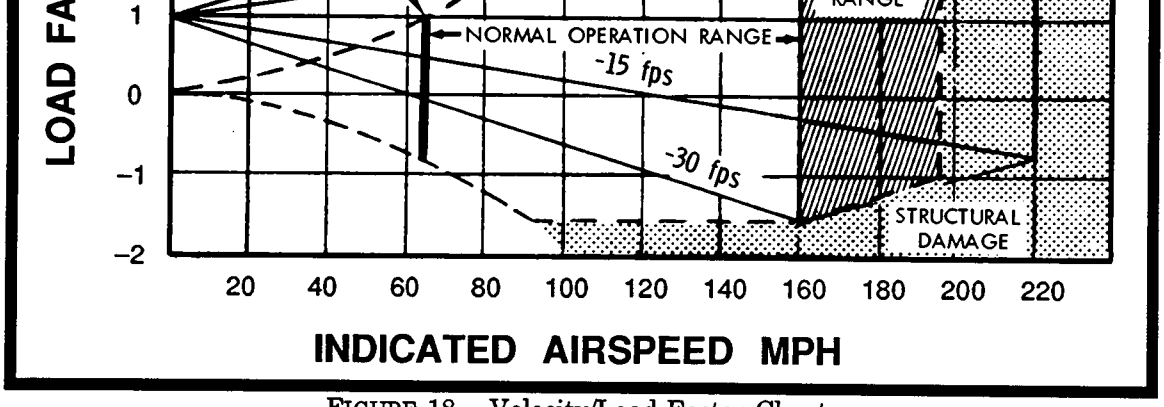


FIGURE 18.—Velocity/Load Factor Chart.

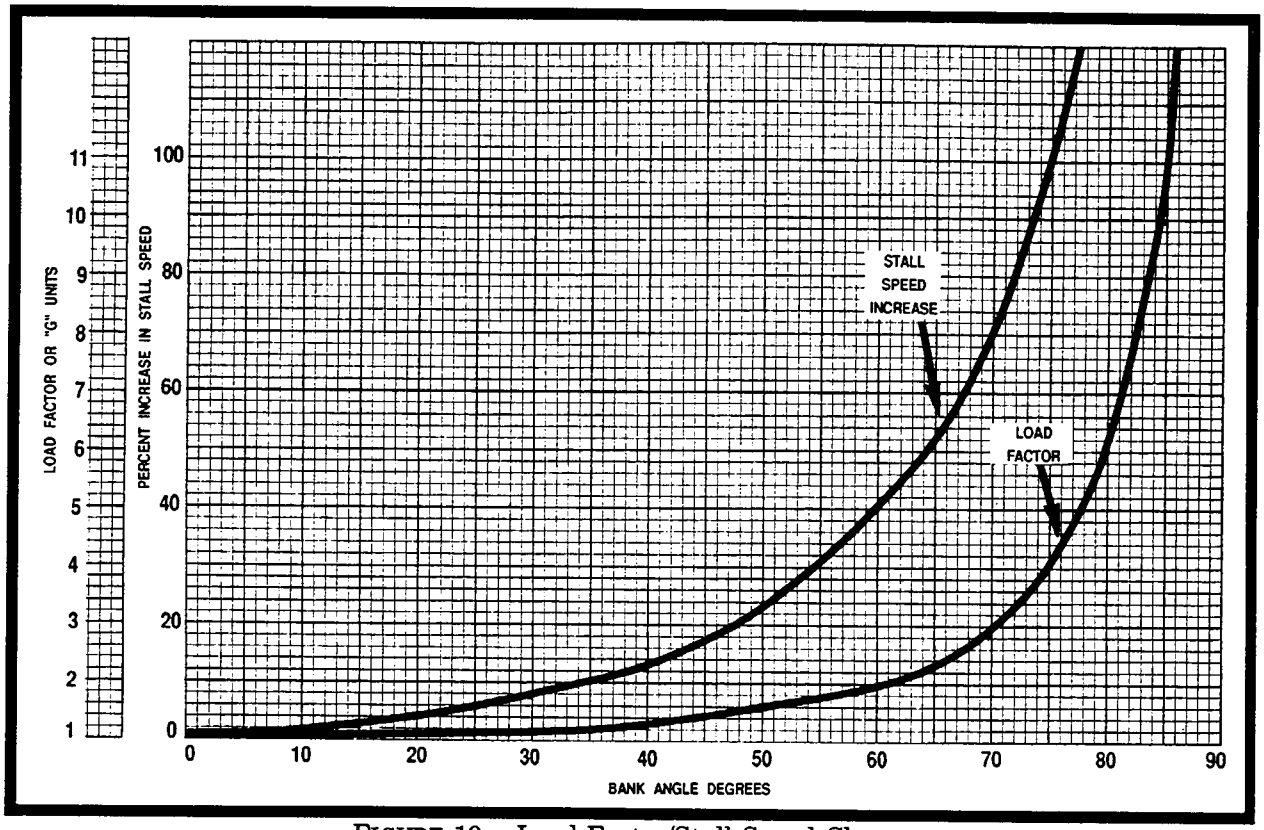


FIGURE 19.—Load Factor/Stall Speed Chart.

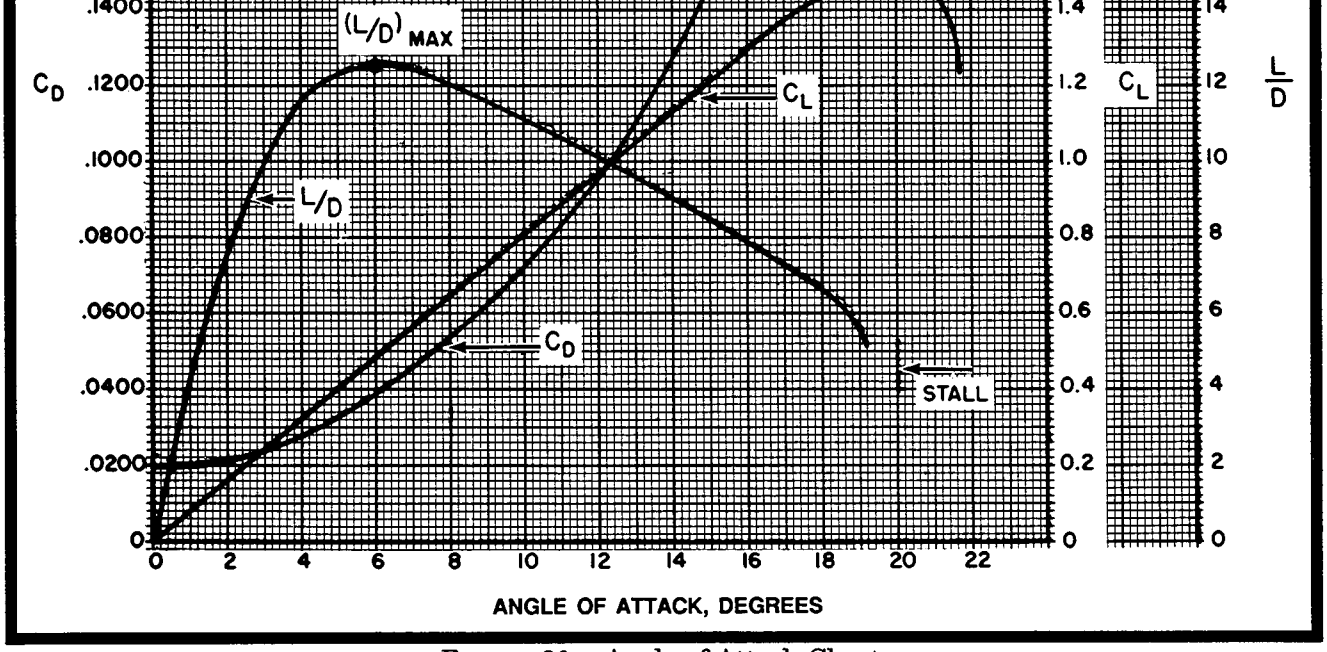


FIGURE 20.—Angle-of-Attack Chart.

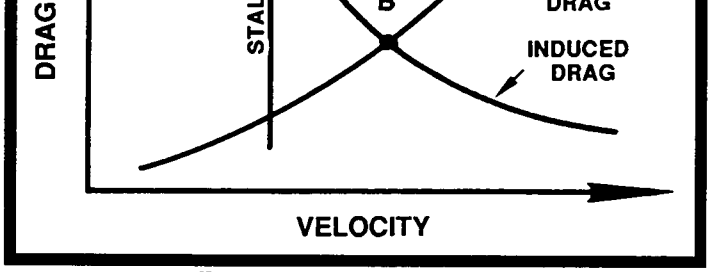


FIGURE 21.—Drag Chart.

AIRCRAFT	1	2	3	4
WING SPAN	40'	35'	48'	30'
AVERAGE WING CHORD	6'	5'	6'	6'

FIGURE 22.—Aspect Ratio.

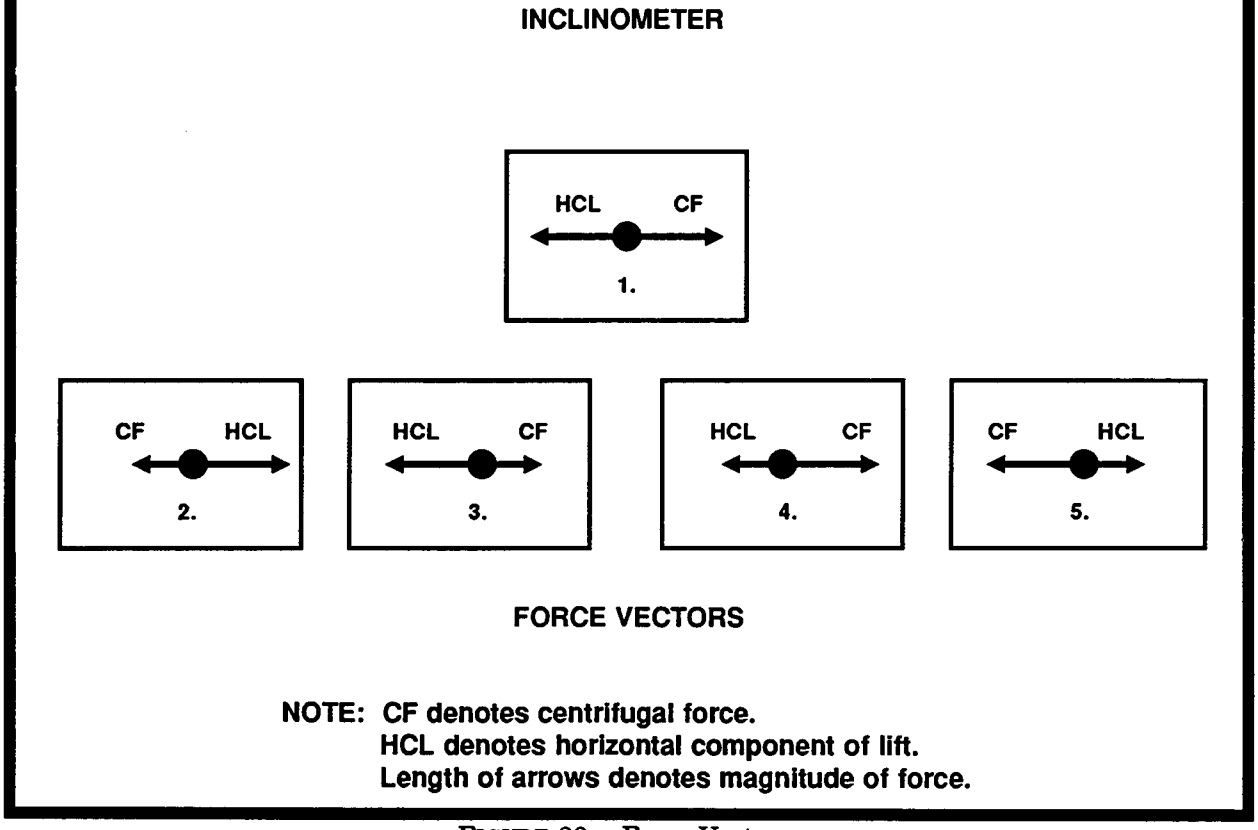


FIGURE 23.—Force Vectors.

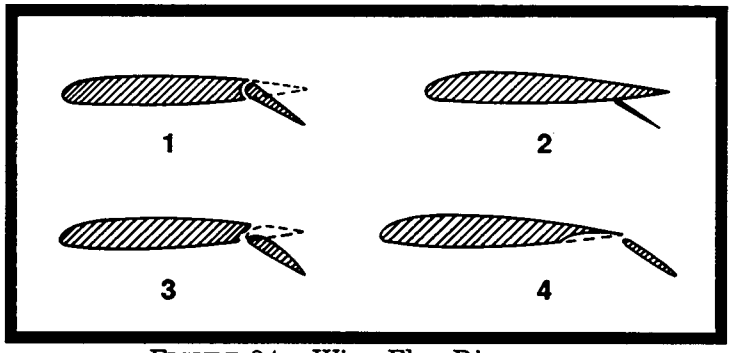
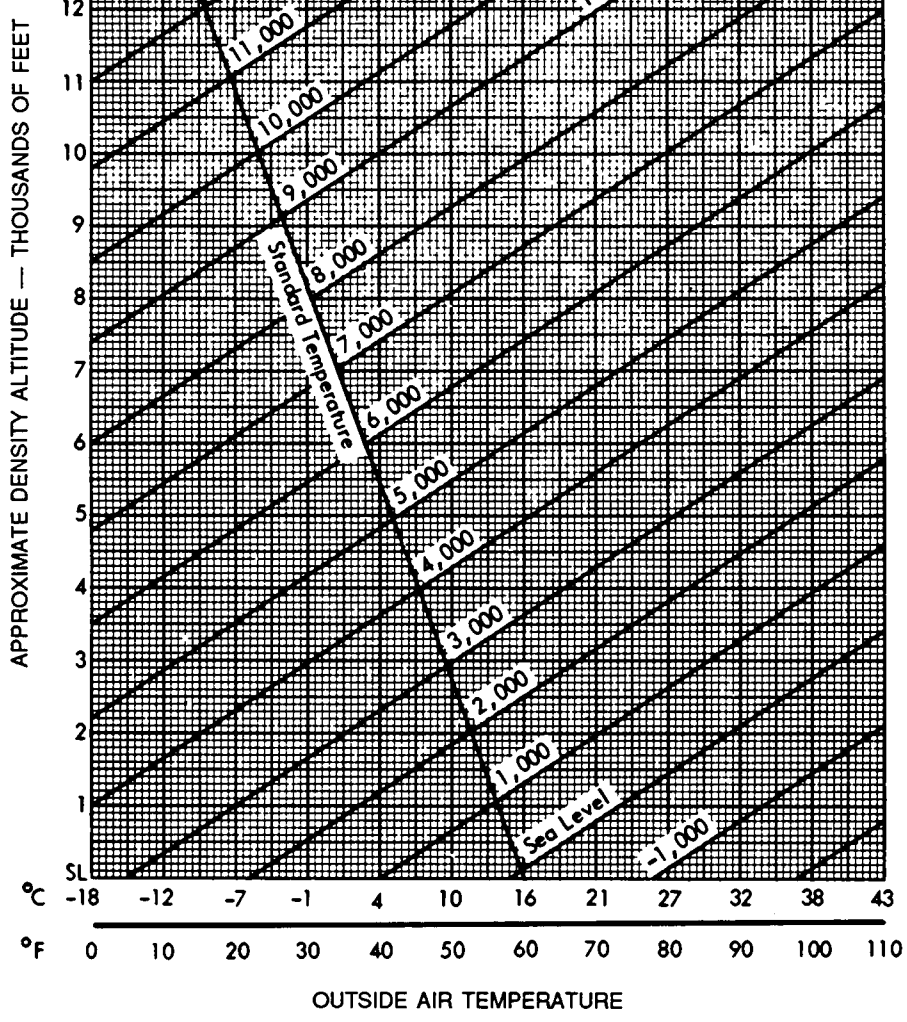


FIGURE 24.—Wing Flap Diagrams.



28.3	1,533
28.4	1,436
28.5	1,340
28.6	1,244
28.7	1,148
28.8	1,053
28.9	957
29.0	863
29.1	768
29.2	673
29.3	579
29.4	485
29.5	392
29.6	298
29.7	205
29.8	112
29.9	20
29.92	0
30.0	-73
30.1	-165
30.2	-257
30.3	-348
30.4	-440
30.5	-531
30.6	-622
30.7	-712
30.8	-803

FIGURE 25.—Density Altitude Chart.

160	161	110	112	110	111
180	181	120	121	120	120
200	201	130	131	130	129
220	221	140	141	140	138
240	242	150	151		
		160	161		

*Maximum Flap Speed 160 MPH **Maximum Flap Speed 140 MPH

NOTE: CAS IS IDENTICAL TO TIAS

STALL SPEED CHART

MPH-CAS

4990 POUNDS GROSS WEIGHT

CONFIGURATION	ANGLE OF BANK 0°	20°	40°	60°
Gear and Flaps Up	84	87	97	119
Gear Down and Flaps 15°	80	83	92	113
Gear Down and Flaps 45°	76	79	87	108

FIGURE 26.—Airspeed/Stall Speed Chart.

TAKEOFF DATA

TAKEOFF DISTANCE WITH 20° FLAPS FROM HARD-SURFACED RUNWAY

GROSS WEIGHT LB	IAS AT 50 FT MPH	HEAD WIND MPH	AT SEA LEVEL & 59°F		AT 2500 FEET & 50°F		AT 5000 FT & 41°F		AT 7500 FT & 32°F	
			GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE	GROUND RUN	TO CLEAR 50' OBSTACLE
2200	55	0	345	680	405	770	480	885	580	1040
		15	205	460	245	525	295	615	365	725
		30	100	275	120	320	155	380	195	460
2600	60	0	500	915	585	1045	705	1230	855	1470
		15	310	635	370	735	455	870	560	1055
		30	165	395	200	465	255	565	325	695
3000	64	0	695	1210	820	1405	990	1675	1205	2045
		15	450	855	535	1005	660	1215	815	1505
		30	250	555	310	665	390	820	500	1030

NOTE: INCREASE DISTANCES 10% FOR EACH 25°F ABOVE STANDARD TEMPERATURE FOR PARTICULAR ALTITUDE.

FIGURE 27.—Takeoff Data Chart.

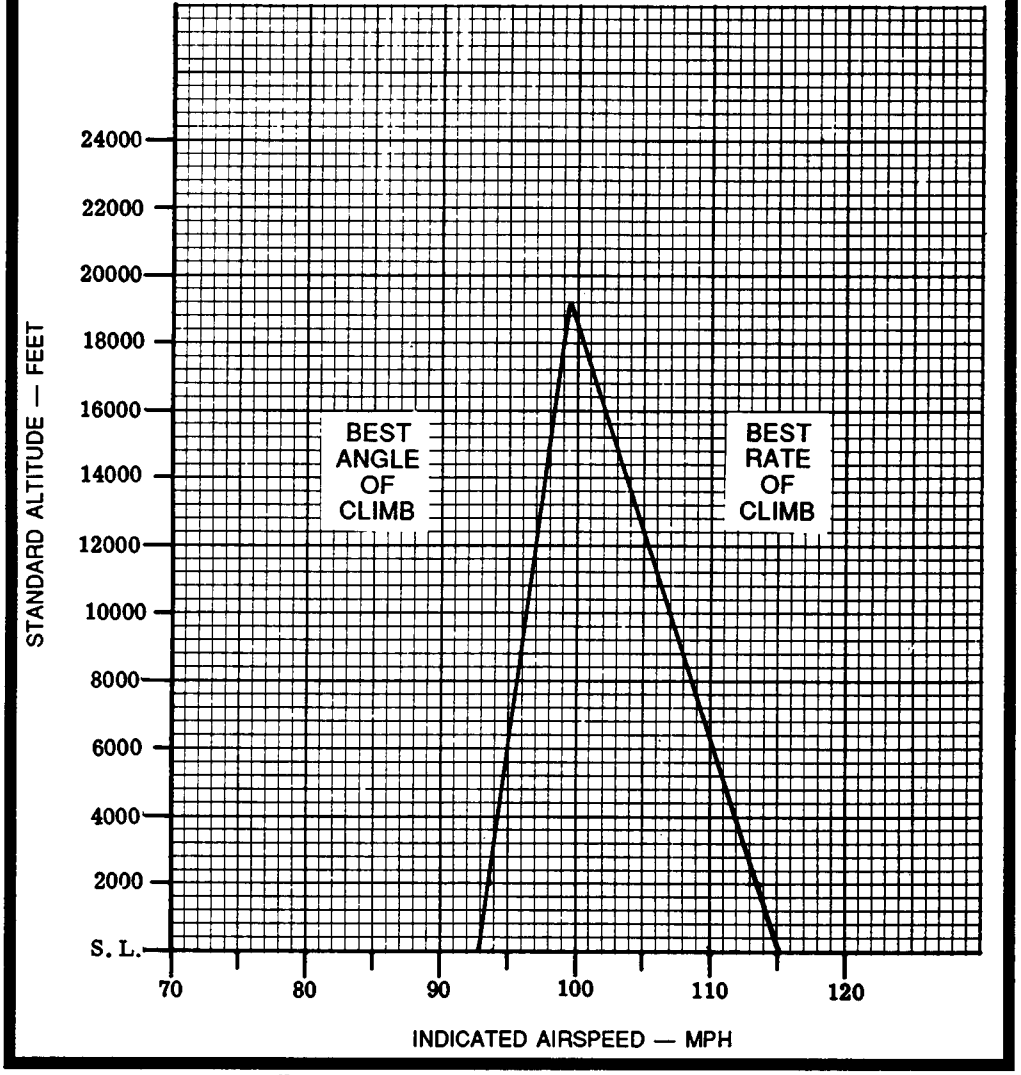


FIGURE 28.—Maximum Climb Chart.

WEIGHT-POUNDS	50 FOOT OBSTACLE SPEED-KIAS	PRESSURE ALTITUDE-FEET	0°C GROUND ROLL - FEET	0°C TOTAL DISTANCE TO CLEAR 50-FEET	20°C GROUND ROLL - FEET	20°C TOTAL DISTANCE TO CLEAR 50 FEET	40°C GROUND ROLL - FEET	40°C TOTAL DISTANCE TO CLEAR 50 FEET
5500	82	Sea Level	1390	1760	1490	1890	1590	2020
		1000	1530	1950	1640	2080	1760	2230
		2000	1680	2150	1810	2300	1940	2470
		3000	1860	2380	2000	2550	2150	2750
		4000	2060	2650	2220	2850	2380	3070
		5000	2280	2950	2460	3190	2640	3450
		6000	2530	3310	2730	3590	2950	3900
		7000	2830	3750	3160	4190	3410	4570
		8000	3280	4420	3540	4840	3830	5330
		9000	3690	5170	4000	5730	4330	6420
		10,000	4150	6140	4500	6980	4880	8130
5100	78	Sea Level	1160	1470	1240	1570	1330	1680
		1000	1280	1620	1370	1730	1470	1850
		2000	1400	1780	1500	1910	1610	2040
		3000	1550	1960	1660	2100	1780	2260
		4000	1710	2180	1840	2340	1970	2510
		5000	1890	2410	2030	2590	2180	2790
		6000	2090	2690	2250	2890	2420	3120
		7000	2330	3010	2510	3250	2700	3520
		8000	2600	3400	2800	3690	3030	4010
		9000	2920	3890	3270	4360	3530	4760
		10,000	3390	4580	3660	5030	3960	5560
4700	75	Sea Level	960	1220	1020	1300	1090	1380
		1000	1050	1340	1120	1430	1200	1520
		2000	1150	1460	1230	1560	1320	1670
		3000	1270	1610	1360	1720	1460	1840
		4000	1400	1770	1500	1900	1610	2030
		5000	1540	1960	1650	2100	1780	2250
		6000	1700	2170	1830	2330	1970	2500
		7000	1890	2410	2030	2590	2190	2790
		8000	2100	2700	2260	2910	2440	3140
		9000	2350	3040	2540	3290	2730	3570
		10,000	2620	3430	2830	3730	3060	4060

FIGURE 29.—Maximum Performance Takeoff Chart.

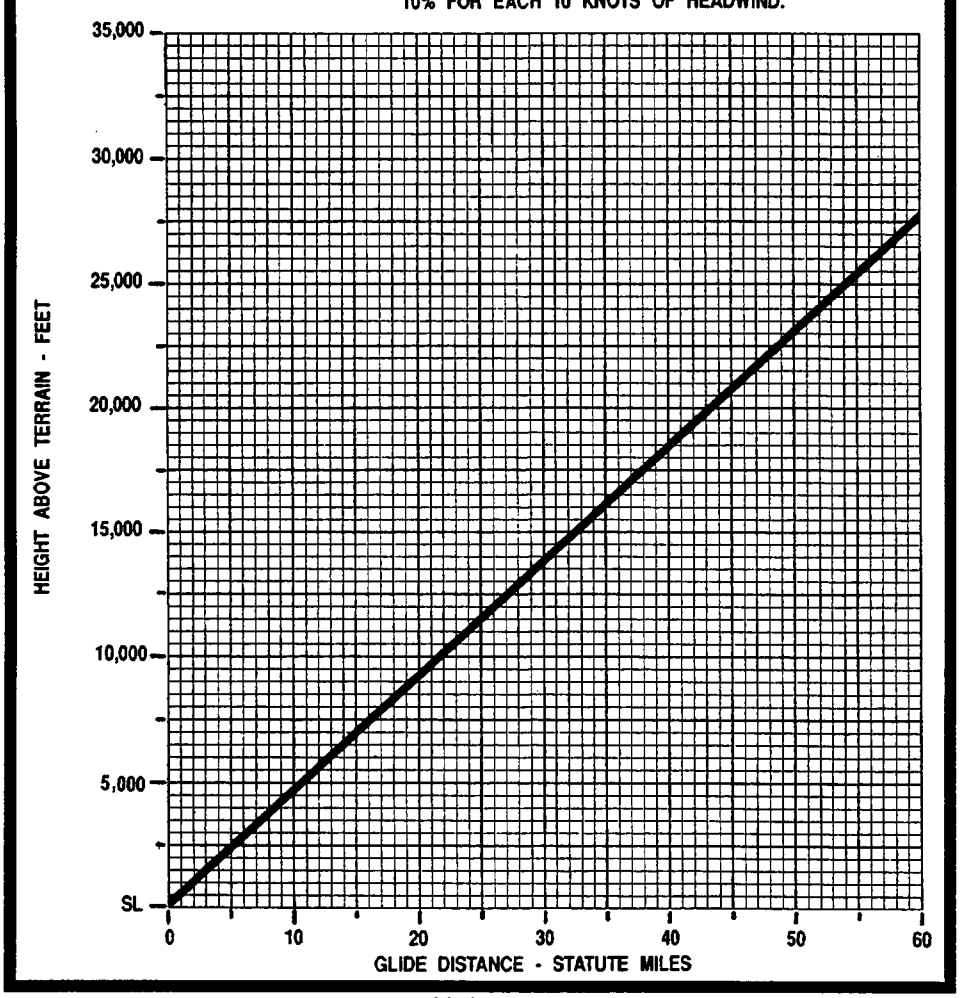


FIGURE 30.—Glide Distance Chart.

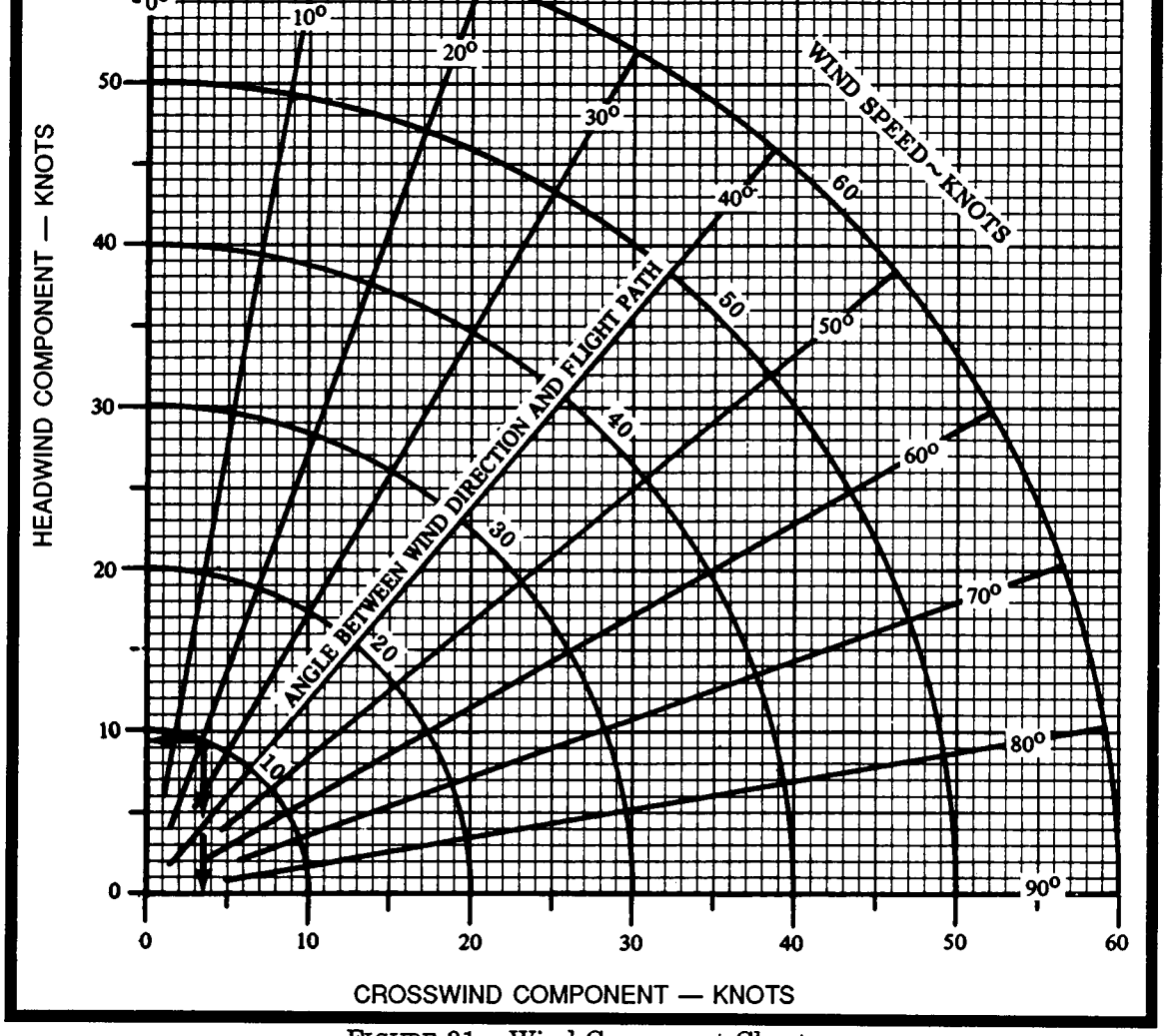


FIGURE 31.—Wind Component Chart.

NOTE: GROUND ROLL IS APPROX. 53% OF TOTAL LANDING DISTANCE OVER A 50 FT OBSTACLE.

WEIGHT POUNDS	IAS APPROACH SPEED (ASSUMES ZERO INSTR. ERROR)	
	MPH	KNOTS
3400	90	78
3200	87	76
3000	84	73
2800	81	70
2600	78	68
2400	75	65

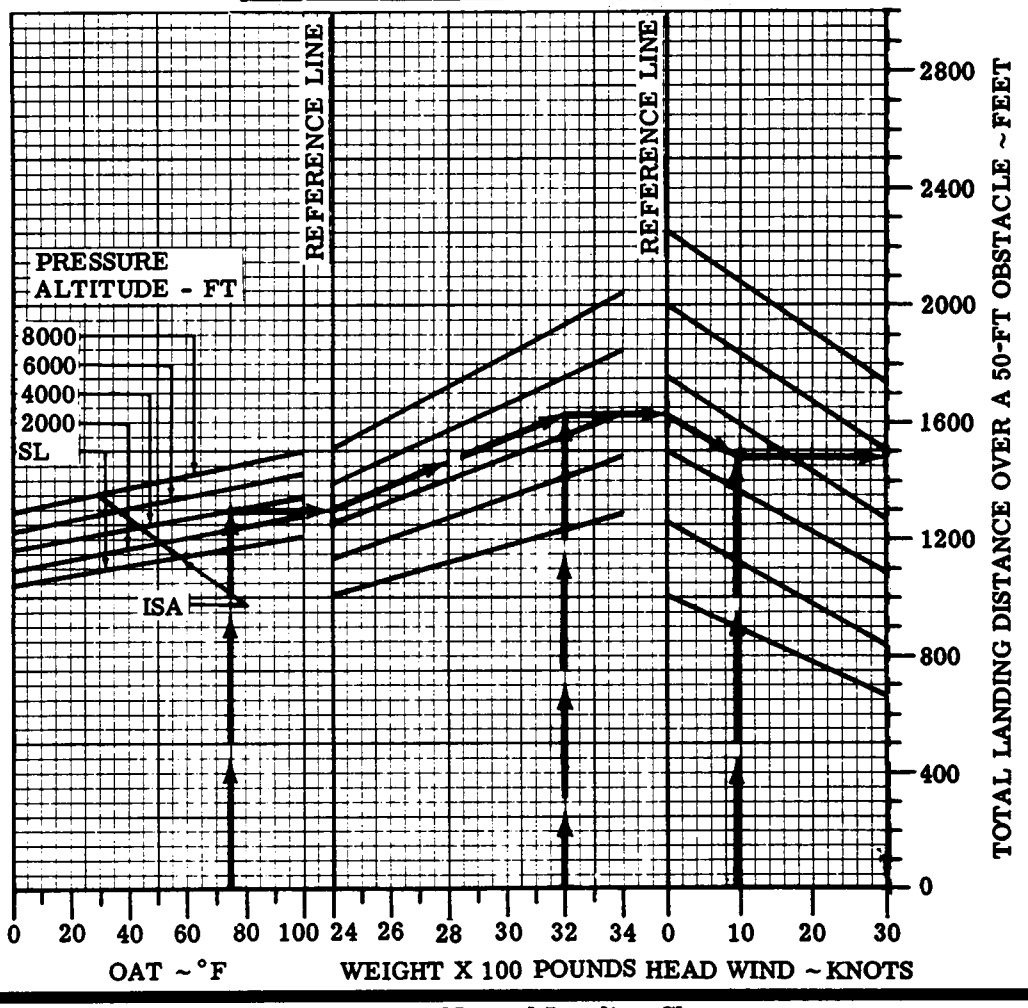


FIGURE 32.—Normal Landing Chart.

FIGURE 33.—Weight and Balance Diagram.

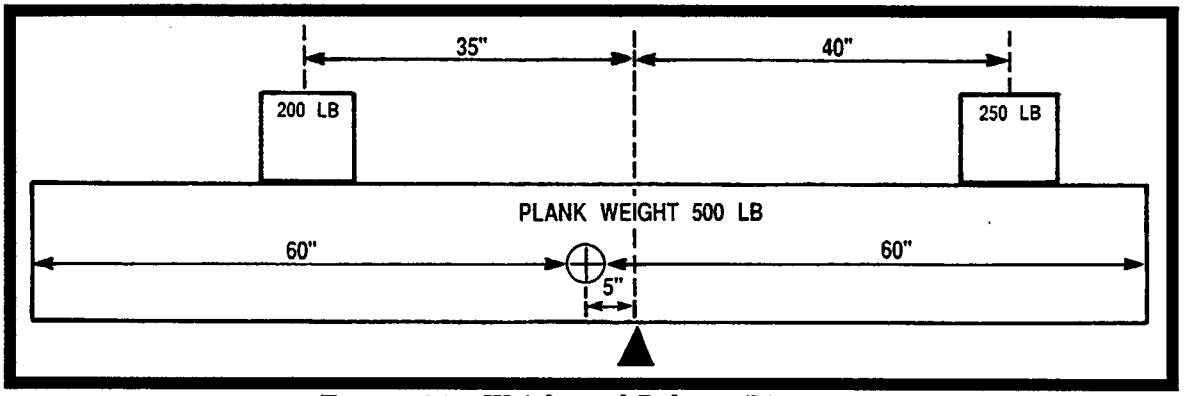


FIGURE 34.—Weight and Balance Diagram.

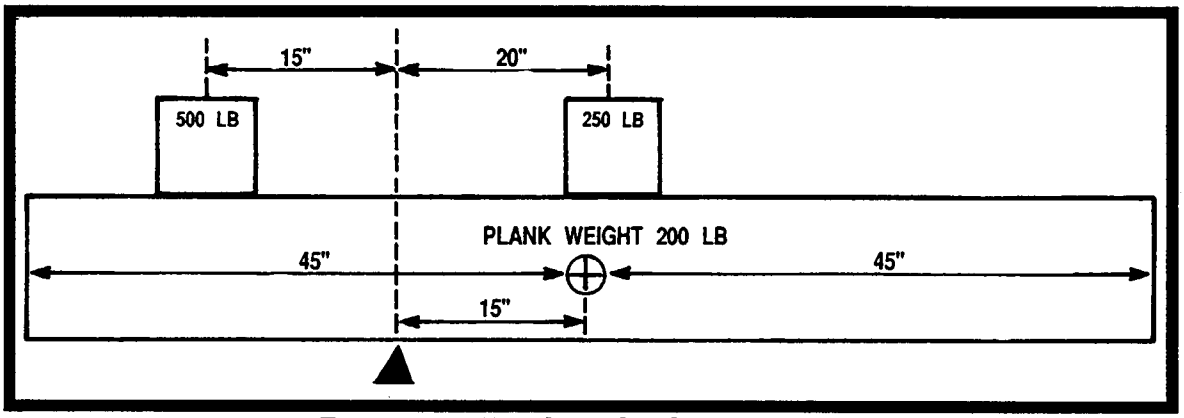


FIGURE 35.—Weight and Balance Diagram.

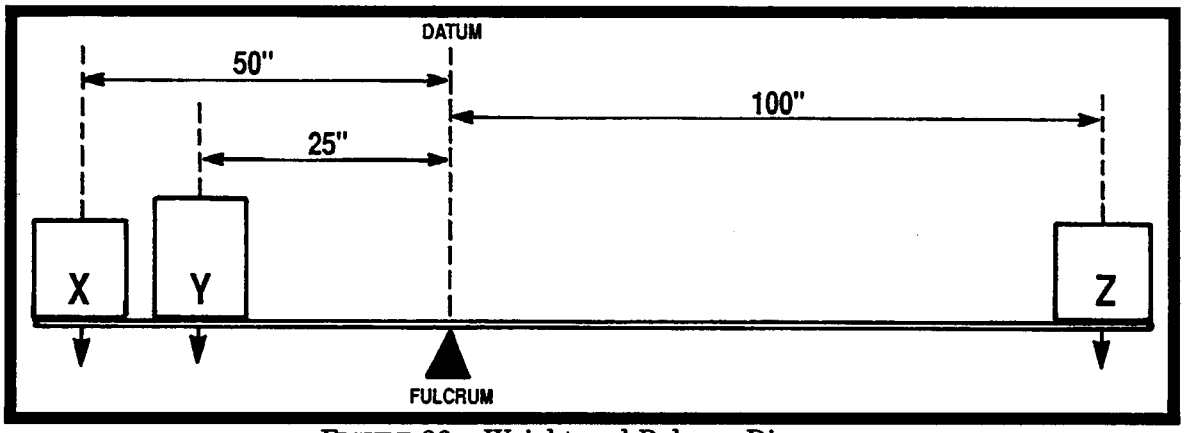


FIGURE 36.—Weight and Balance Diagram.

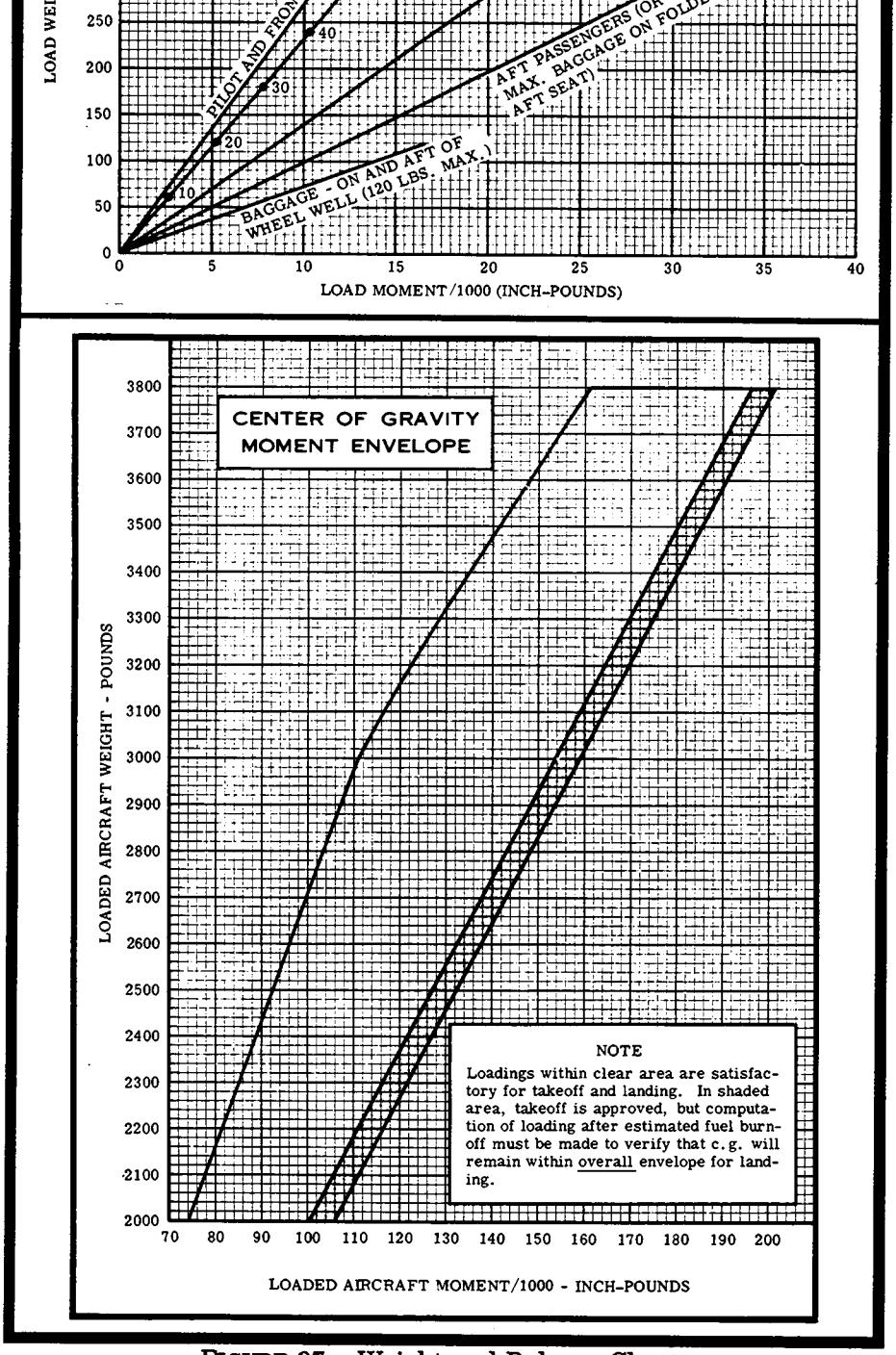
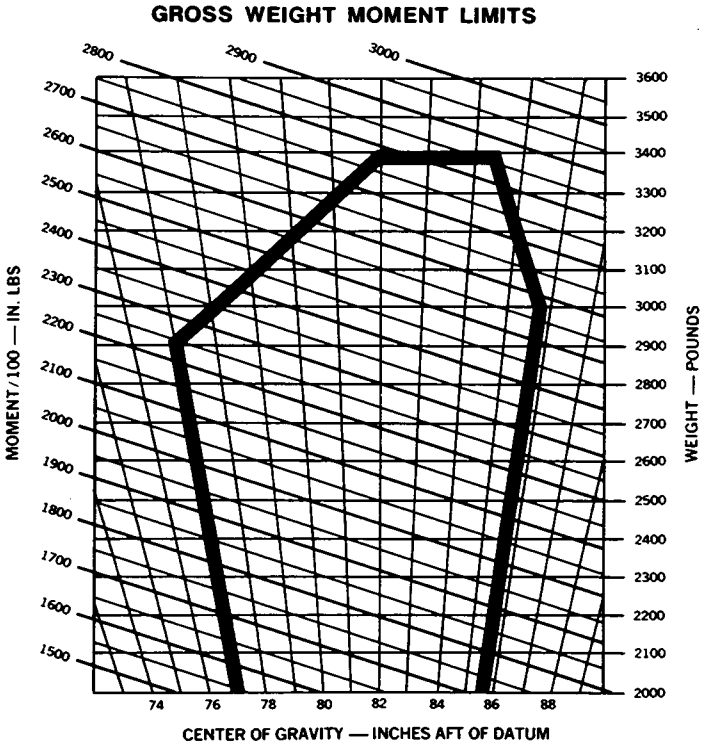


FIGURE 37.—Weight and Balance Chart.

130	111	130	157	177
140	119	140	169	190
150	128	150	182	204
160	136	160	194	218
170	145	170	206	231
180	153	180	218	245
190	162	190	230	258
200	170	200	242	273

FUEL					
ARM 75					
Gallons	Weight	Moment	Gallons	Weight	Moment
5	30	23	45	270	203
10	60	45	49	294	221
15	90	68	55	330	248
20	120	90	60	360	270
25	150	113	65	390	293
30	180	135	70	420	315
35	210	158	75	450	338
40	240	180	80	480	360

BAGGAGE	
ARM 150	
Weight	Moment
10	15
20	30
30	45
40	60
50	75
60	90
70	105
80	120
90	135
100	150
110	165
120	180
130	195
140	210
150	225
160	240
170	255
180	270
190	285
200	300
210	315
220	330
230	345
240	360
250	375
260	390
270	405



NOTE: All moments are equal to $\frac{\text{weight X arm}}{100}$

FIGURE 38.—Weight and Balance Chart.

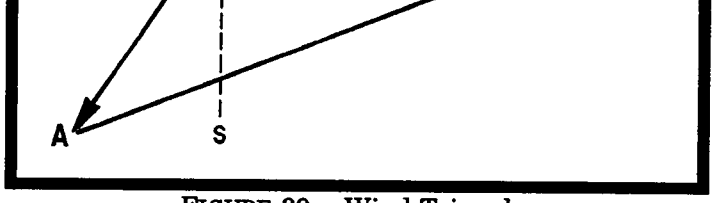


FIGURE 39.—Wind Triangle.

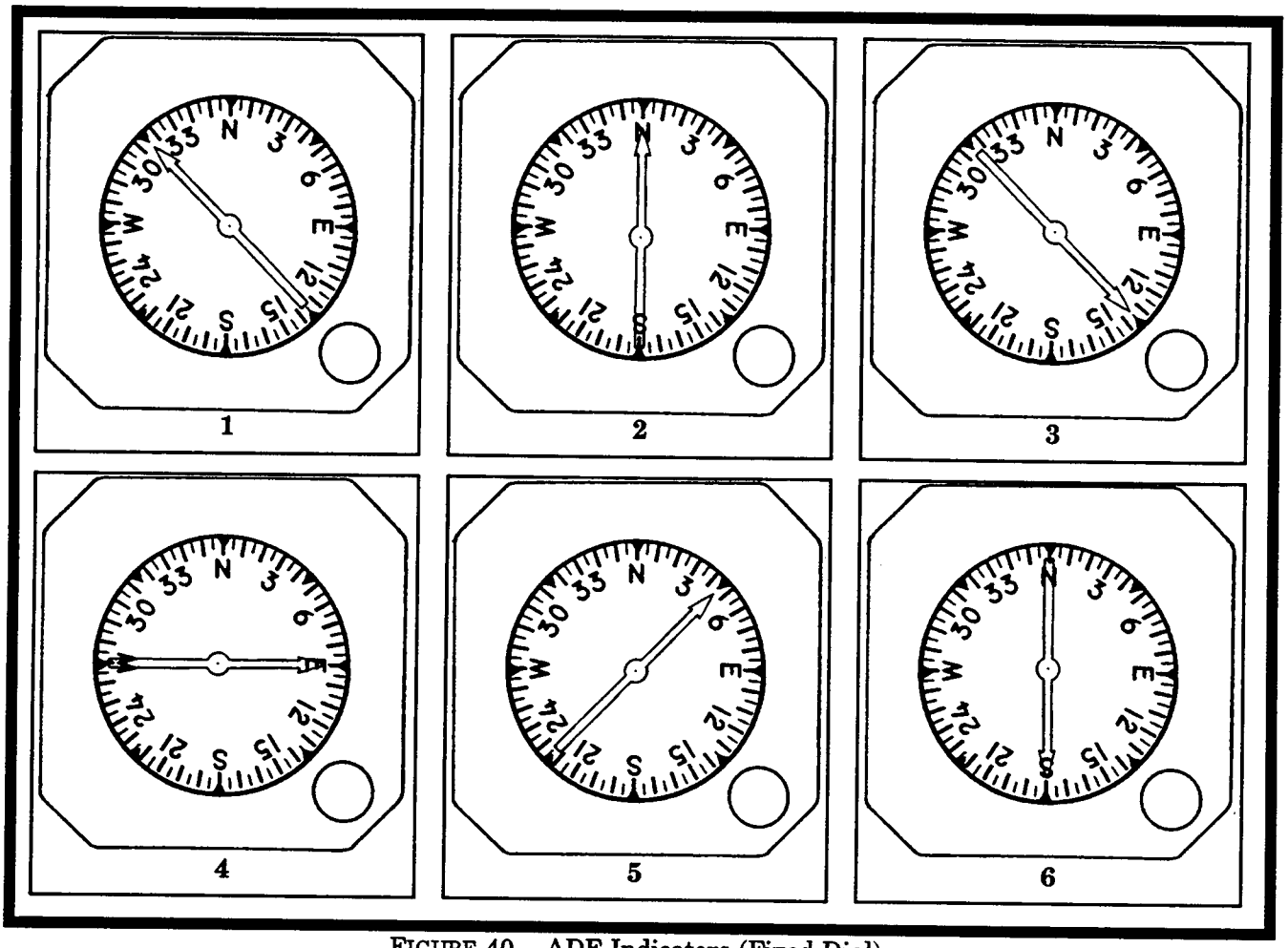


FIGURE 40.—ADF Indicators (Fixed-Dial).

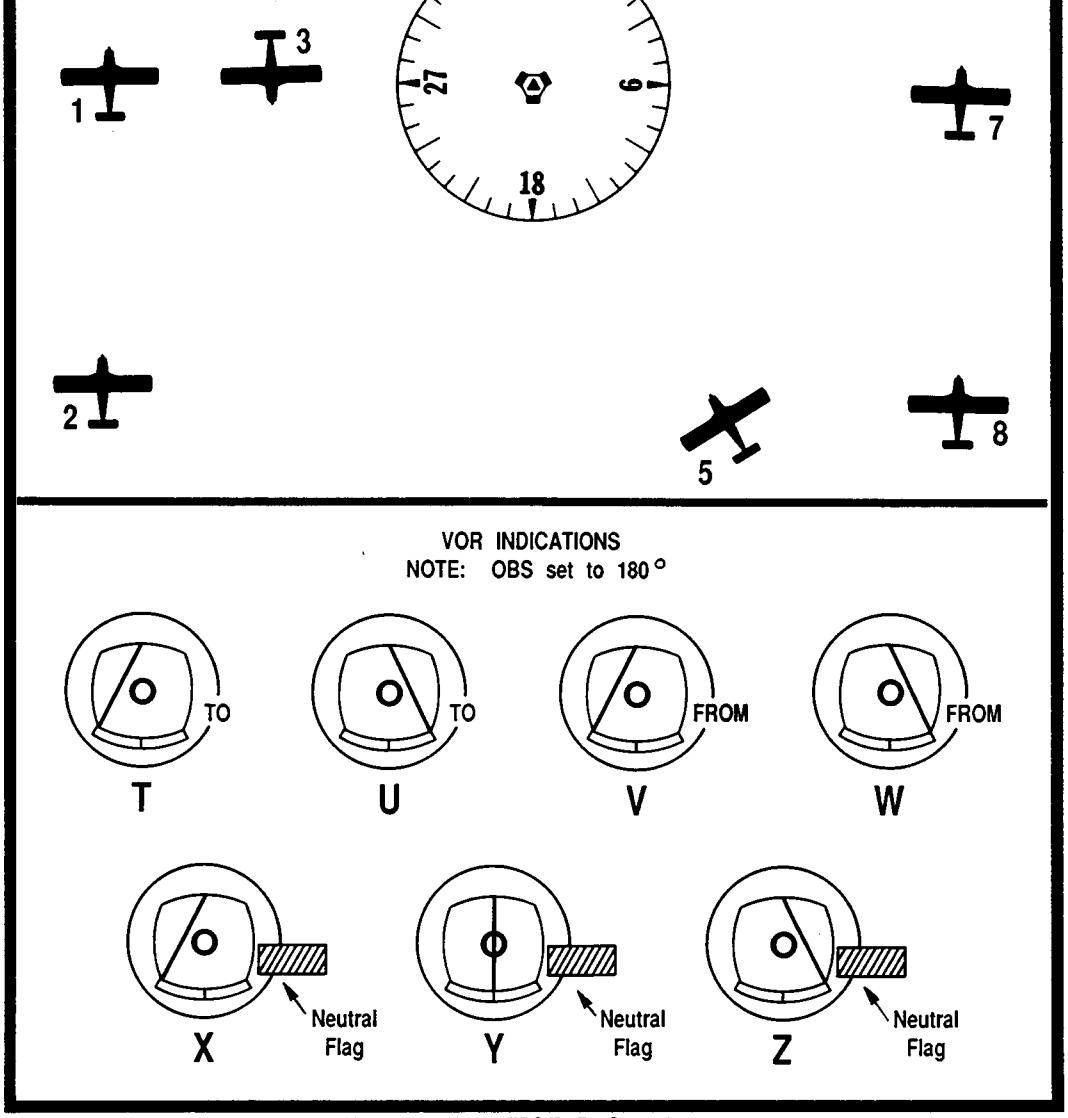


FIGURE 41.—VOR Indications.

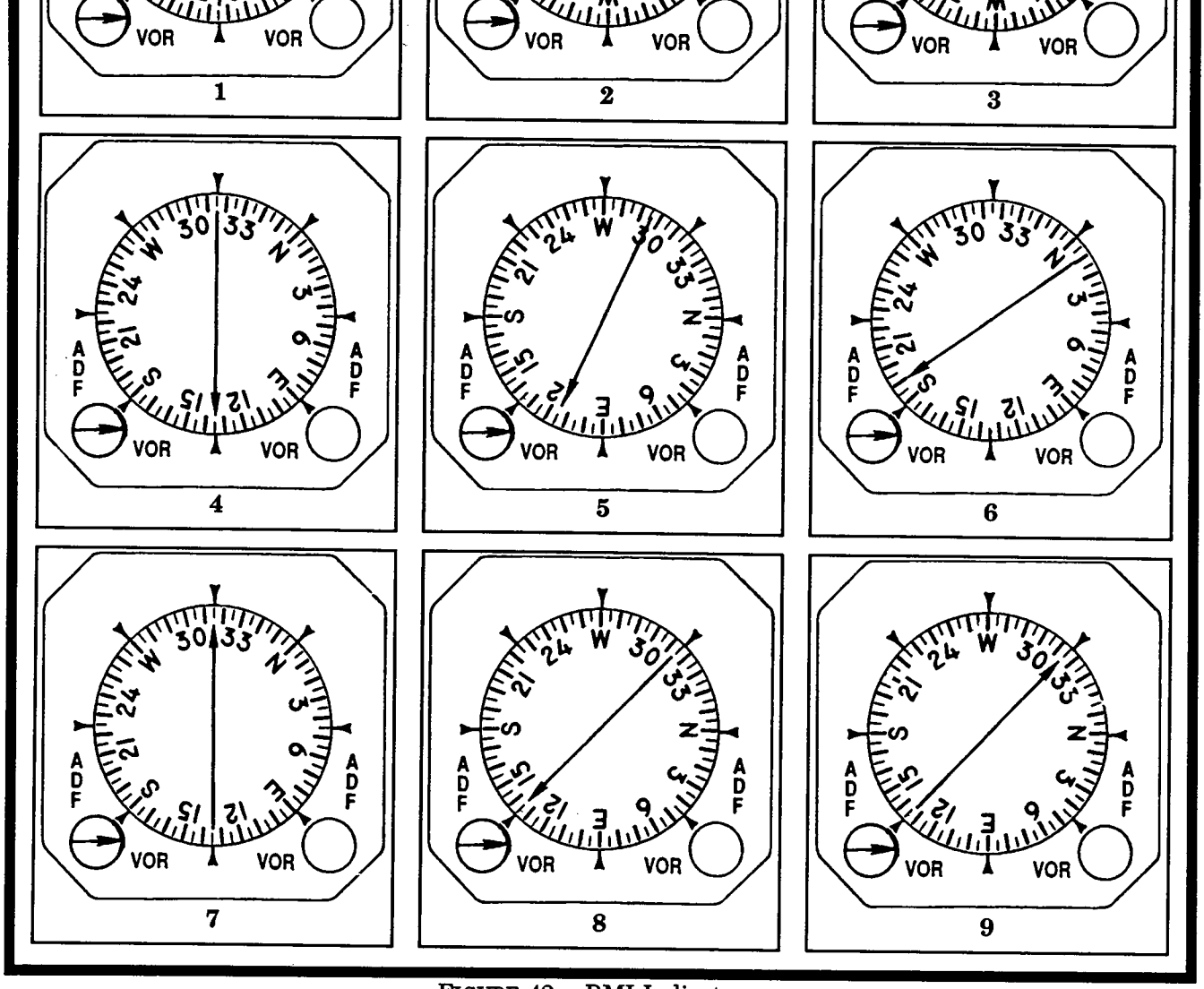


FIGURE 42.—RMI Indicators.

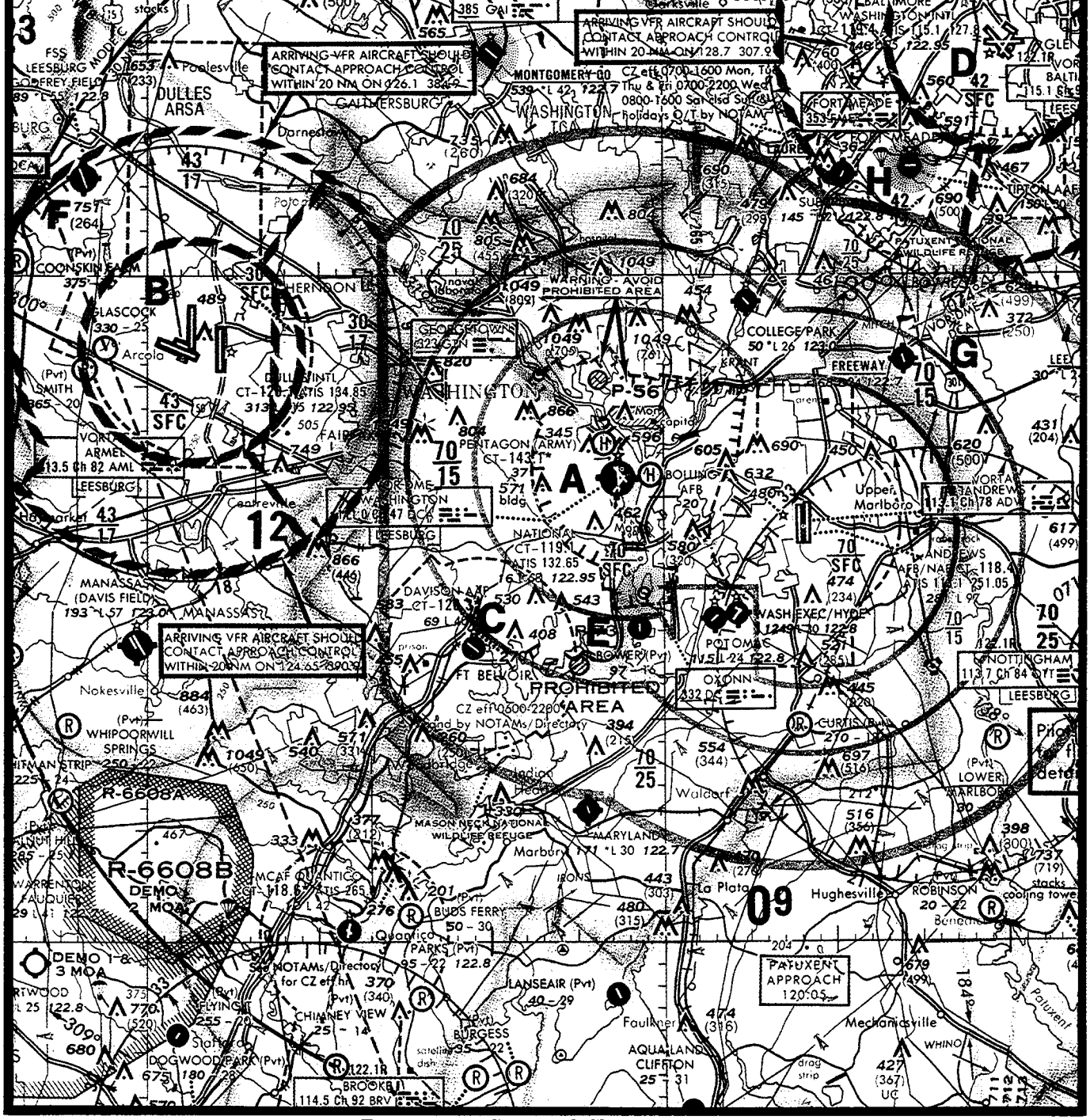


FIGURE 43.—Sectional Chart Excerpt.

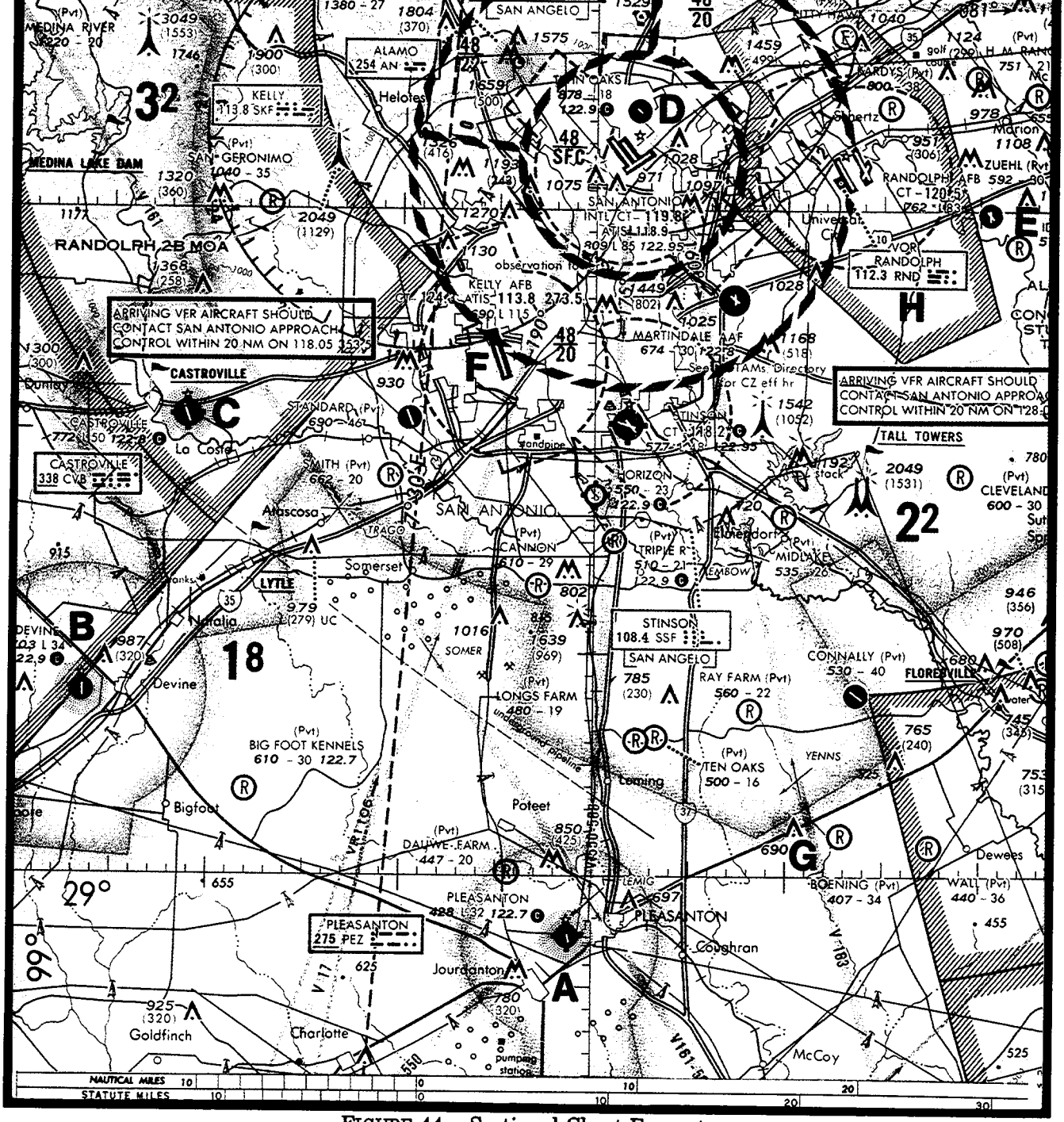


FIGURE 44.—Sectional Chart Excerpt.

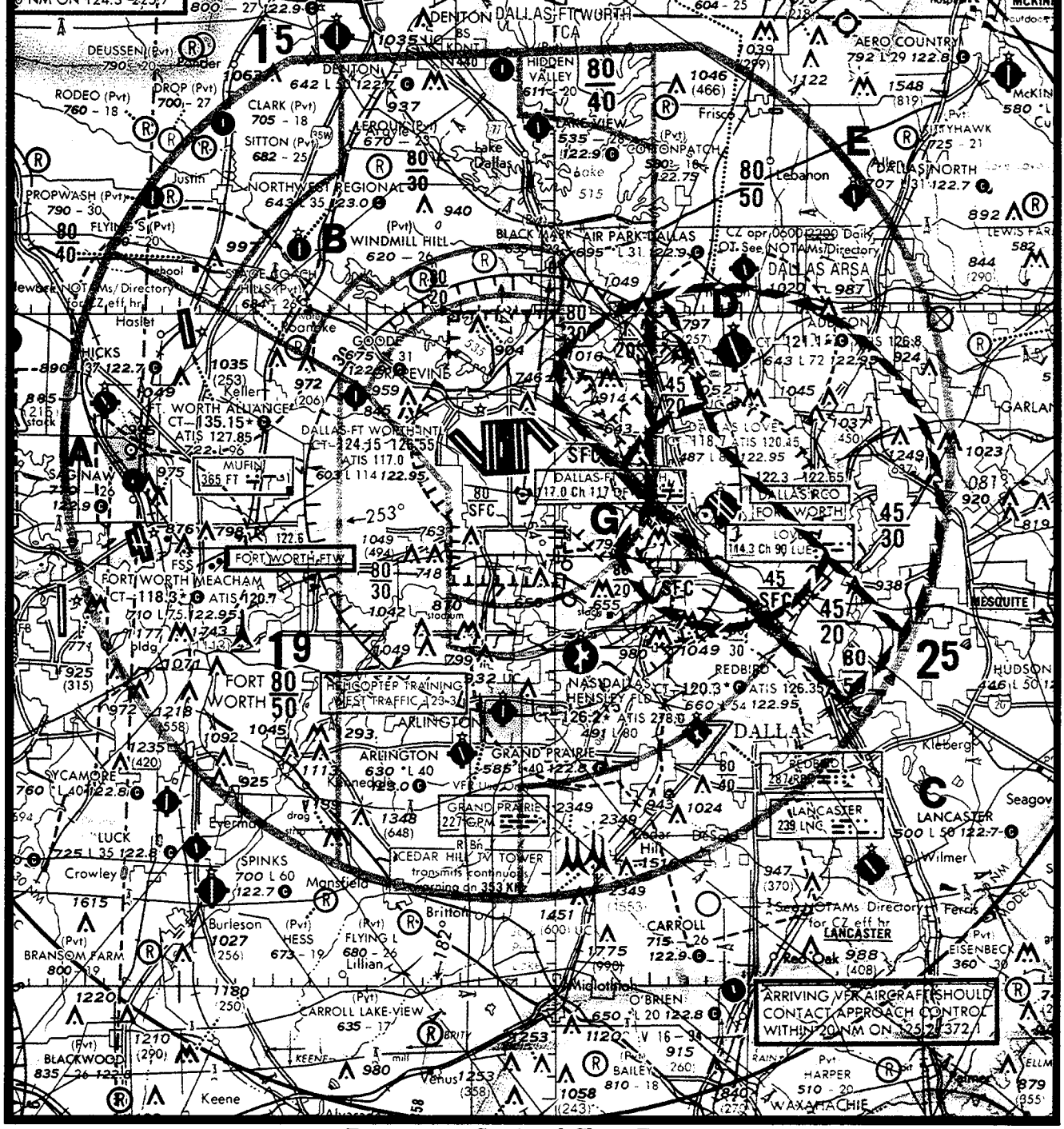
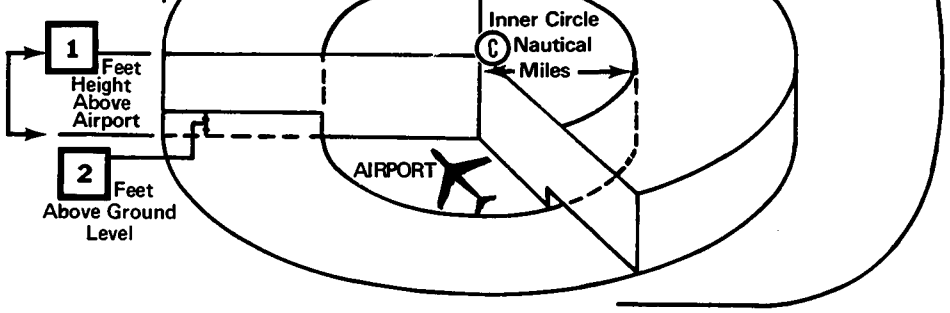


FIGURE 45.—Sectional Chart Excerpt.



Services upon establishing two-way radio communication and radar contact:
Sequencing Arrivals
IFR/IFR Standard Separation
IFR/VFR Traffic Advisories and Conflict Resolution
VFR/VFR Traffic Advisories

IFR: Instrument Flight Rules
VFR: Visual Flight Rules

FIGURE 46.—Airport Radar Service Area Diagram.

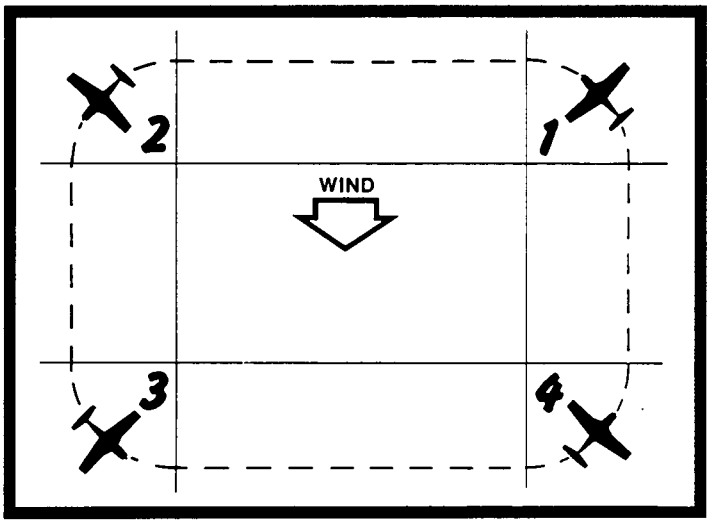


FIGURE 47.—Rectangular Course.

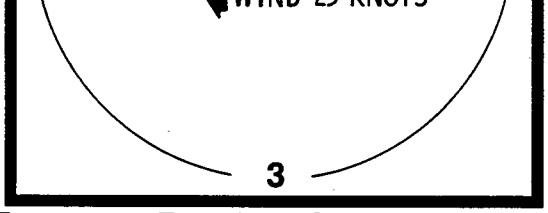


FIGURE 48.—Turn Around a Point Diagram.

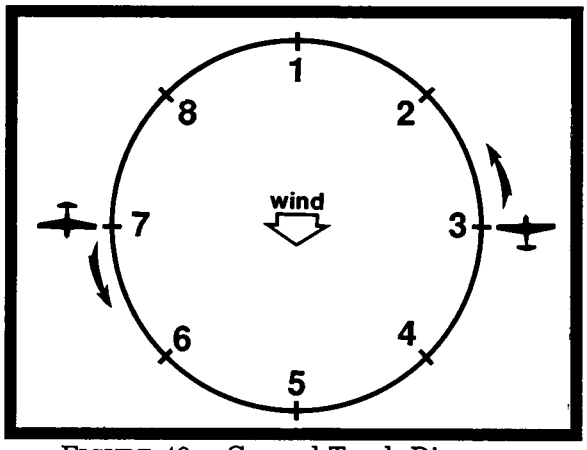


FIGURE 49.—Ground Track Diagram.

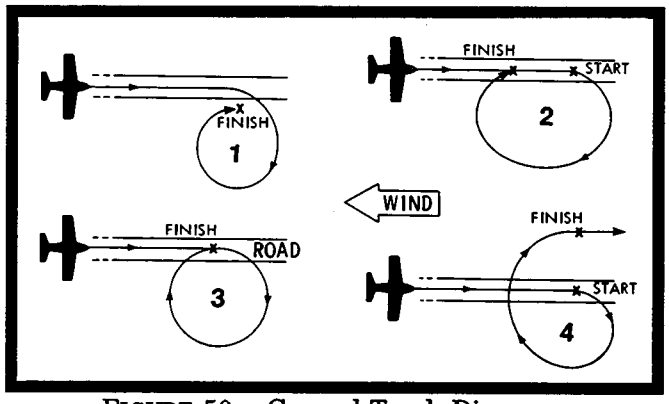


FIGURE 50.—Ground Track Diagram.

FIGURE 51.—S-Turn Diagram.

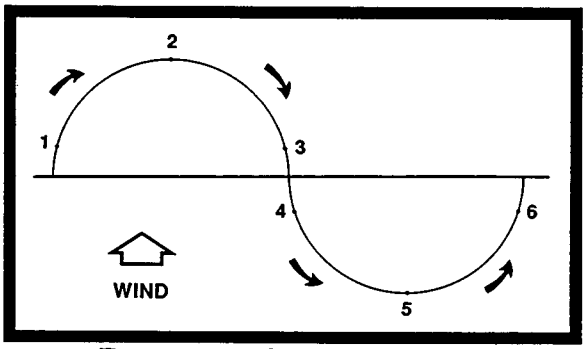


FIGURE 52.—S-Turn Diagram.

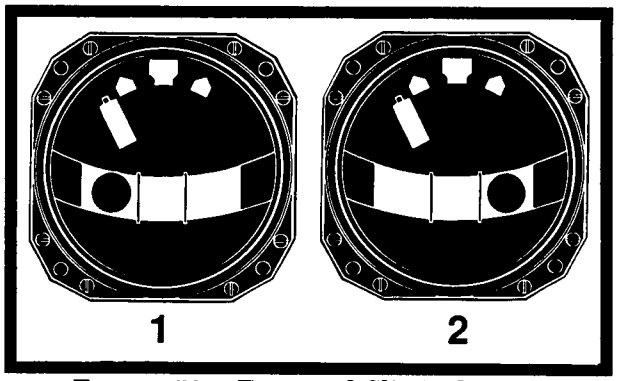


FIGURE 53.—Turn-and-Slip Indicator.

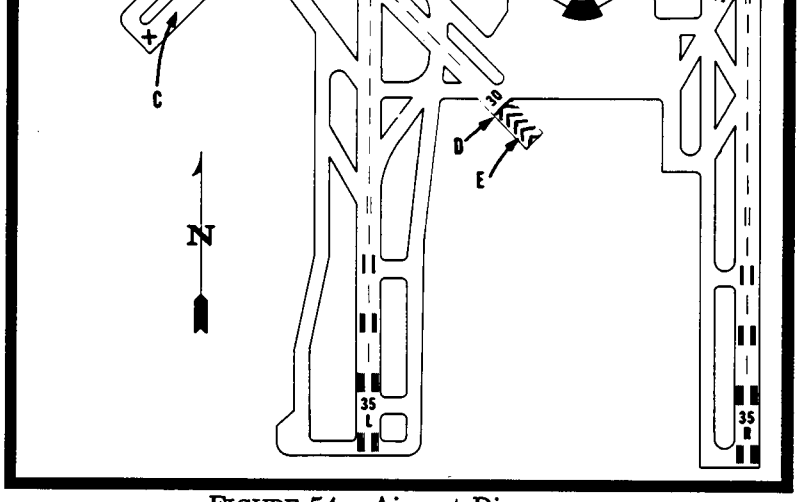


FIGURE 54.—Airport Diagram.

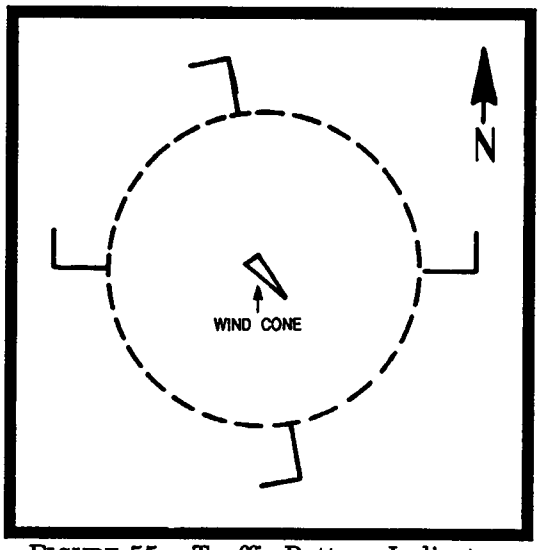


FIGURE 55.—Traffic Pattern Indicator.

RWY 18: VASI(V4L)—GA 3.0°TCH 52'. Rgt tfc. RWY 36: VASI(V4L)—GA 3.0°TCH 52'. REIL. Tree. Rgt tfc.
AIRPORT REMARKS: Attended continuously. CAUTION: Birds on and in vicinity of arpt. Ldg Rwy 18 & takeoff Rwy 36 not authorized to acft over 60,000 lbs gross weight unless crosswind NW-SE rwys exceed acft safe operating capability. Rwy 13R-31L 2500' wavy surface from twy T to taxiway D. Noise sensitive areas all quadrants, noise abatement procedures in effect for fixed and rotary wing tfc, for information call arpt manager 214-670-6610. Taxiway H CLOSED to acft over 110,000 lbs GWT and wingspan greater than 75'. Flight Notification Service (ADCUS) available. Private pilot certificate or better required to takeoff or land, no student solo flights permitted.
COMMUNICATIONS: ATIS 120.15 UNICOM 122.95
FORT WORTH FSS (FTW) TF 1-800-WX-BRIEF. NOTAM FILE DAL.
Ⓡ REGIONAL APP CON 125.2 (South) 124.3 (North)
LOVE TOWER 118.7 GND CON 121.75 CLNC DEL 120.0
Ⓡ REGIONAL DEP CON 118.55
ARSA ctc APP CON
RADIO AIDS TO NAVIGATION: NOTAM FILE DAL.
LOVE (L) VORW/DME 114.3 LUE Chan 90 32°50'51"N 96°51'42"W at fld. 490/08E
CONIS NDB (LOM) 275 LV 32°46'29"N 96°46'30"W 311° 5.8 NM to fld.
ILS 110.3 I-DAL Rwy 13L.
ILS 111.7 I-DPX Rwy 13R.
ILS 111.7 I-LVF Rwy 31L. LOM CONIS NDB. BC unusable
ILS 110.3 I-OVW Rwy 31R.
ASR

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§ **REDBIRD** (RBD) 6 SW UTC-6(-5DT) 32°40'49"N 96°52'02"W DALLAS-FT. WORTH
660 B S4 FUEL 100LL, JET A OX 1, 3 H-2K, 4F, 5B, L-13C, 17A, A
RWY 13-31: H5452X150 (CONC) S-35, D-60, DT-110 MIRL .3% up NW IAP
RWY 13: REIL. VASI(V4L)—GA 3.0° TCH 50'. Trees.
RWY 31: LDIN. REIL. VASI(V4L)—GA 3.0° TCH 47'. Road.
RWY 17-35: H3801X150 (CONC) S-35, D-60, DT-110 MIRL
RWY 17: REIL. Tree. RWY 35: REIL.
AIRPORT REMARKS: Attended 1300-0400Z‡. Practice VOR Rwy 13 apch not authorized. When twr closed ACTIVATE LDIN Rwy 31 and VASI Rwy 13—120.3. Control Zone effective 1300-0400Z‡.
WEATHER DATA SOURCES: LAWRS
COMMUNICATIONS: ATIS 126.35 CTAF 120.3 UNICOM 122.95
FORT WORTH FSS (FTW) TF 1-800-WX-BRIEF. NOTAM FILE RBD.
Ⓡ REGIONAL APP CON 123.9 Ⓡ REGIONAL DEP CON 125.2
TOWER 120.3 (1300-0400Z‡) GND CON 121.7 CLNC DEL 125.45
RADIO AIDS TO NAVIGATION: NOTAM FILE DFW.
DALLAS-FT WORTH (H) VORTACW 117.0 DFW Chan 117 32°51'57"N 97°01'40"W 136° 13.8 NM to fld. 560/08E.
LOVE (L) VORW/DME 114.3 LUE Chan 90 32°50'51"N 96°51'42"W 174° 10.0 NM to fld. 490/08E. NOTAM FILE DAL.
NDB (HW) 287 RBD 32°40'37"N 96°52'15"W at fld. NOTAM FILE RBD.
ILS 108.5 I-RBD Rwy 31. Unmonitored when tower closed.

DALLAS NORTH (See PLANO)

DAN E. RICHARDS MUNI (See PADUCAH)

DAVID HOOKS 30°07'31"N 95°33'57"W NOTAM FILE DWH. HOUSTON
NDB (MHW) 521 DWH 164° 3.9 NM to David Wayne Hooks Mem. L-17B

DAVID WAYNE HOOKS MEM (See HOUSTON)

FIGURE 56.—Airport/Facility Directory.